

## Effect of Melasma on Quality of Life of Patients using Dermatology Life Quality Index

Ali Amar, Sumbal Nida, Muhammad Mudassir\*

Pakistan Air Force Hospital Shahbaz, Jacobabad Pakistan, \*Combined Military Hospital Attock/National University of Medical Sciences, Pakistan

### ABSTRACT

**Objective:** To assess the effect of melasma on the Quality of Life (QoL) of patients using the Dermatology Life Quality Index (DLQI).

**Study Design:** Cross-sectional study.

**Place and Duration of Study:** Department of dermatology PAF Hospital, Jacobabad Pakistan, from Jun 2019 to 2020.

**Methodology:** A total of 103 patients with melasma were enrolled in the study from the dermatology outpatient department after written informed consent. Patients of either gender aged 15 years and above were included in the study. Melasma Area and Severity Index assessed melasma severity. In addition, the impact on Quality of Life was assessed using the Dermatology Life Quality Index questionnaire.

**Results:** Among the 103 patients, 67 (65%) were females, and 36 (35%) were male. The mean age of patients was  $29.50 \pm 7.94$  years and included 78 (75.7%) married and 25 (24.3%) unmarried individuals. Mean Melasma Area and Severity Index was  $22.04 \pm 11.23$ , including 36 (35%) patients with mild, 43 (41.7%) moderate and 24 (23.3%) patients with severe disease, respectively. Overall mean Dermatology Life Quality Index of the sample was  $11.25 \pm 7.78$ , while mean scores for the mild, moderate and severe diseases were  $5.89 \pm 5.58$ ,  $10.33 \pm 5.75$  and  $20.96 \pm 6.62$ , respectively ( $p=0.001$ ), indicating that Quality of Life is significantly more impaired with increased disease severity.

**Conclusion:** Melasma significantly affects the Quality of Life of the patients as measured by Dermatology Life Quality Index. The impact on Quality of Life is directly proportional to the severity of melasma assessed by the Melasma Area Severity Index.

**Keywords:** Dermatology life quality index (DLQI), Melasma area severity index (MASI), Quality of life (QoL).

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### INTRODUCTION

Melasma is a common disorder characterized by a chronic and recurring course. This disorder of hyperpigmentation is due to hyper-functional melanocytes. These melanocytes deposit excessive melanin in the epidermis and dermis.<sup>1</sup> Melasma is more common in women, especially those of reproductive age. It is also more noticeable in body areas with relatively more sun exposure, e.g., the face.<sup>2</sup> Melasma predisposing factors include genetic predisposition, UV light exposure, hormonal influences, pregnancy and some drugs.<sup>3,4</sup>

The prevalence of melasma in the general population is approximately 1%, but it can be as high as 9-50% in high-risk populations.<sup>5</sup> The exact incidence in the Pakistani population is not known. Melasma can occur in all races, especially those living in the tropics and IV-V skin types.<sup>6</sup> It has been suggested that people with skin type I produce minimal additional facial pigmentation on exposure to sunlight while those with type VI skin phenotype already produce the pigment

at maximum. Therefore, skin phenotypes I and VI are characterized by the production of stable pigmentation. This may be a reason for the relatively lower frequency of melasma cases among the European and sub-Saharan Negroid populations. Melasma occurs in all racial groups. Different studies have documented higher occurrence in pigmented skin phenotypes, for example, in South East Asia (including India and Pakistan), the Middle East, Japan, China, Korea and Mediterranean African countries. In the American continent, melasma is more prevalent in the Brazilian and Hispanic populations living in tropical areas, probably due to greater exposure to UV radiation.<sup>7,8</sup>

Multiple studies have documented the detrimental and psychologically devastating effects of melasma on quality of life. It affects the social life and emotional well-being of the patients and also influences their leisure activities.<sup>9,10</sup>

The purpose of this study is to document the impact of melasma on quality of life (QoL) in the local population, as few studies have been conducted on this important topic. Furthermore, the measurement of QoL can improve patient care, especially the need for supportive or psychological intervention.

**Correspondence:** Dr Ali Amar, Department of Dermatology, Pakistan Air Force Hospital Shahbaz, Jacobabad, Pakistan.

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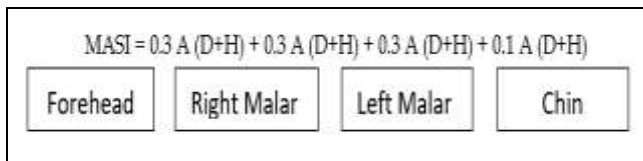
**METHODOLOGY**

This cross-sectional study was conducted at the Department of Dermatology, PAF Hospital Shahbaz, Jacobabad Pakistan after the approval of the Hospital Ethical Review Committee (Certificate no.14069-N/15 July 20). The study was carried out from June 2019 to June 2020. The sample size was calculated using the WHO calculator, keeping confidence interval 95% and absolute precision 10%. The anticipated population proportion of 40% was taken from a regional study by KrupaShankar *et al.*<sup>11</sup>

**Inclusion Criteria:** Patients of clinically diagnosed melasma, of either gender, aged above 15 years and of all severities, i.e., mild, moderate and severe, who could themselves understand and complete the questionnaire in English or Urdu versions, were enrolled.

**Exclusion Criteria:** Diagnosed patients with photosensitivity disorders and photo contact eczema were excluded from the study. In addition, patients with psychiatric illness, systemic causes of pigmentation, e.g. hemochromatosis, Addison’s disease etc., patients with a present or history of intake of drugs implicated in facial pigmentation, e.g., Chlorpromazine, Amiodarone, Chloroquine, Hydroxychloroquine, Minocycline etc. and those with facial dermatoses, e.g., lichen planus pigments, Actinic lichen planus, ashy dermatosis, fixed drug eruption (FDE), nevus of Ota, nevus spills and post-inflammatory hyperpigmentation were also excluded from the study.

A total of 103 patients from the outpatient department (OPD) were enrolled after informed written consent. The Melasma Area and Severity Index (MASI) was calculated by subjective assessment of 3 factors: homogeneity (H), area of involvement (A) and darkness (D). The forehead (F), left malar region (LM), right malar region (RM), and chin (C) corresponded to 30%, 30%, 30%, and 10% of the total face, respectively. A consultant dermatologist did the clinical assessment, and MASI was calculated as per the formula (Figure-1).



**Figure-1: Calculation of Melasma Area and Severity Index (MASI)**

Area (A), darkness (D) and homogeneity (H) parameters were defined (Table-I). The total score

ranged from 0 to 48. MASI in terms of severity was further classified as mild (0-16), moderate (17-32) and severe (33-48). Other demographic characteristics like age and gender were also recorded.

**Table-I: Melasma area and severity index (MASI) parameters**

Score	Darkness (D)	Homogeneity (H)	Area (A)
0	Absent	Minimal	No Involvement
1	Slight	Slight	<10%
2	Mild	Mild	10-29%
3	Marked	Marked	30-49%
4	Maximum	Maximum	50-69%
5			70-89%
6			90-100%

Each patient was given a Dermatology Life Quality Index (DLQI) questionnaire to complete in the clinic. The questionnaire was made in English and translated into Urdu to understand the enrolled individuals better. Understanding of questions was rechecked individually by the treating dermatologist while completing the questionnaire.

DLQI includes ten questions. Patients were asked to score with a scale ranging from 0-3 for each question. They were asked how their daily routines were affected by melasma over the preceding week. The response for each question was recorded as 0=, not at all/not relevant, 1= a little, 2= a lot, and 3= very much. The total score ranged from 0 to 30. A higher score meant poorer Quality of Life (QoL). A score of 0-1 meant that patients had no effect on their QoL. The score of 2-5 represented a small effect, 6-10 a moderate effect, 11-20 a very large effect, and 21-30 an extremely large effect.<sup>12</sup>

Statistical Package for Social Sciences (SPSS) version 21.0 was used for the data analysis. The quantitative variables like age, MASI scores and DLQI were calculated by taking means and standard deviation. The qualitative variable like gender was represented as frequency and percentages. A comparison of two groups in terms of mean DLQI was carried out using an independent t-test, while for three groups comparison, ANOVA was used along with post hoc analysis. The *p*-value of ≤0.05 was considered significant.

**RESULTS**

A total of 103 patients with clinically diagnosed melasma were evaluated. The sample included 67 (65%) females and 36 (35%) males. The mean age of patients was 29.50±7.94 years. The sample included 78 (75.7%) married and 25 (24.3%) unmarried patients. The mean MASI score was 22.04±11.23. There were 36

(35%) patients with mild disease, 43 (41.7%) patients with moderate disease and 24 (23.3%) patients with severe disease, according to MASI score defined in the methodology above. There were 43 (41.7%), 31 (30.1%) and 29 (28.2%) patients with a disease duration of up to 9 months, 18 months and more than 18 months, respectively. The mean DLQI score of the sample was  $11.25 \pm 7.78$ . Mean DLQI scores with respect to the severity of disease using MASI score showed that patients with mild, moderate and severe disease had a mean DLQI score of  $5.89 \pm 3.58$ ,  $10.33 \pm 5.75$  and  $20.96 \pm 6.62$ , respectively (Figure-2).

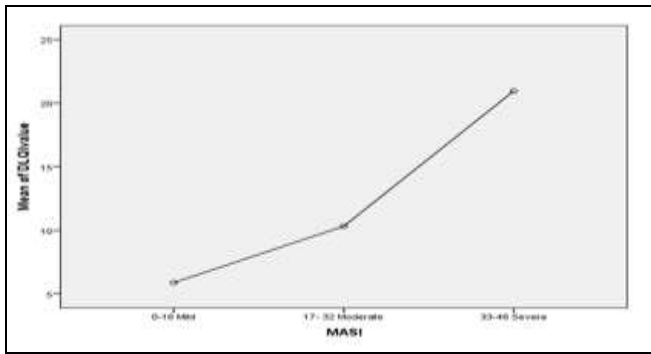


Figure-2: Relation of Mean Dermatology Life Quality Index with Severity of Melasma (MASI)

The difference in mean DLQI score among the three severity groups based on MASI was analyzed using ANOVA and was found statistically significant ( $p=0.001$ ), indicating that QoL is significantly more impaired with increased disease severity (Table-II).

Table-II: Post hoc Analysis of Melasma Severity groups in terms of Dermatology Life Quality Index

Melasma Area and Severity Index (MASI)	Melasma Area and Severity Index (MASI)	p-value	95% Confidence Interval (CI)
Mild (0-16)	17- 32 Moderate	0.001	-7.37 to -1.50
	33-48 Severe	<0.001	-18.49 to -11.64
Moderate (17-32)	0-16 Mild	0.001	1.50 to 7.37
	33-48 Severe	<0.001	-13.94 to -7.32
Severe (33-48)	0-16 Mild	<0.001	11.64 to 18.49
	17- 32 Moderate	<0.001	7.32 to 13.94

Patients were divided into three groups based on the duration of the disease. Mean DLQI scores for patients having disease duration of 1-9 months, 10-18 months and more than 18 months were  $8.63 \pm 7.21$ ,  $9 \pm 6.42$  and  $17.55 \pm 6.42$ , respectively ( $p=1.00$ ), statistically not significant. Mean DLQI score comparison with gender revealed that females had a higher DLQI score ( $12.22 \pm 7.9$ ) than males ( $9.44 \pm 7.54$ ). However, it

was not statistically significant ( $p=0.084$ ). Mean DLQI scores were compared between different age groups, which showed statistically non-significant results ( $p > 0.05$ ). Married patients had a lower mean DLQI score ( $10.56 \pm 7.52$ ) in comparison with unmarried individuals ( $13.40 \pm 8.34$ ), which, however, was statistically not significant ( $p=0.13$ ).

**DISCUSSION**

Melasma is a common, chronic and recurring hyperpigmentation disorder due to hyper-functional melanocytes and manifests clinically as patches and macules of hyperpigmentation, most commonly on the face.<sup>1,13,14</sup> Due to its chronic and recurring course, it significantly affects patients' quality of life. Different studies documented the mean age of patients between 30-40 years.<sup>13,15,16,17</sup> In our study, it was  $29.50 \pm 7.94$ . This pattern of early presentation is generally common among the Asian population, probably due to the social norms and customs and the fact that the second to third decade of life is considered "the age of marriage" in this world. The difference in mean DLQI among different age groups was insignificant; however, the mean DLQI was lowest in patients over 35 years of age ( $9.59 \pm 6.59$ ). A study conducted by Ali *et al.*<sup>17</sup> Farag *et al.*<sup>13</sup> and Balkrishnan *et al.*<sup>15</sup> also showed that the patients of higher age groups, i.e. 45-55 years, had lower mean DLQI in the study sample. The frequency of the female population in our study was 65%, consistent with other regional studies by Ali *et al.*<sup>17</sup> 16 (82%) and Sarkar *et al.*<sup>17</sup>(79.5%).<sup>18</sup> There can be several reasons, for example, hormonal influences or an increased sense of consciousness regarding the cosmetic self-image.<sup>19</sup>

Regarding the impact on QoL between the two genders, although mean DLQI was slightly higher in females than males ( $12.22 \pm 7.79$  vs  $9.44 \pm 7.54$ ), there was no statistically significant difference. Similar trends were noticed in studies conducted by Ali *et al.*<sup>16</sup> and Arellano *et al.*<sup>20</sup> Mean DLQI in our study was  $11.25 \pm 7.78$  compared to  $17.08 \pm 5.22$  and  $5.8 \pm 3.88$  in studies conducted by Ali *et al.*<sup>17</sup> and Farag *et al.*<sup>13</sup> respectively. Our study showed that QoL was significantly more adversely affected in patients with more severe disease in terms of MASI score (mean DLQI  $5.89 \pm 3.58$  for mild disease vs  $20.96 \pm 6.62$  for severe disease,  $p=0.001$ ). Similar results were seen by Arellano *et al.*<sup>20</sup> Farag *et al.*<sup>13</sup> and Balkrishnan *et al.*<sup>15</sup> In our study, although there was no significant difference in QoL with disease duration within the group, mean DLQI was higher in patients with disease duration of

more than 18 months. Dominguez *et al.*<sup>21</sup> demonstrated similar results, with QoL being more affected in cases with longer disease duration. No significant difference in impairment of QoL between married and unmarried patients was seen in our study, contrary to common social belief. Similar results were published by Dominguez *et al.*<sup>21</sup>

Although melasma does not cause significant morbidity or mortality, its adverse effects on QoL, social interactions and self-esteem are significant. A study reported that 65% of the patients were dissatisfied with their daily routine due to their disease. Among them, 55% experienced frustration, 42% reported melasma affected their relationships, and 57% reported embarrassment.<sup>14</sup> A study of 140 individuals with melasma from India found that 75% of the time bothered or frustrated by the disease. Among them, melasma was associated with depression (72%), embarrassment (71%), negative appearance (42%), and harmed relationships with other people (42%) most or all of the time.<sup>22</sup> Melasma is most often therapeutically challenging to treat. Relapses are universal. Patients must adhere to a rigorous treatment regimen to avoid relapses.<sup>23</sup> Our current health systems mostly cater for the physical well-being of individuals. However, many cutaneous diseases like melasma impact the patients not by gross disfigurement of the body but by altering the cosmetic mental image of the patient. Considering a significant adverse outcome on mental health and social life, there is a strong need to establish counselling programs and social groups for the patients. This will significantly improve the overall patient outcomes and guide the clinicians toward more holistic and efficient patient care.

## CONCLUSION

Melasma significantly affects the quality of life (QoL) of the patients objectively measured by DLQI. The impact on QoL is directly proportional to the severity of melasma assessed by MASI.

**Conflict of Interest:** None

## Author's Contribution

AA: Principal author, data collection, data compilation, text writing, SN: Data analysis, compilation of results, proof reading, study design, MM: Data collection, study design.

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