IJAM

ORIGINAL RESEARCH PAPER ISSN (O) : 2663 - 046X | ISSN (P) : 2663 - 0451

ASSESSING IMPACT OF MELASMA ON QUALITY OF LIFE USING HI-MELASQOL SCALE AND MASI SCORE

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KEY WORDS : Melasma, Hi-MELASQOL, MASI Score, Quality of life

ABSTRACT

Background: Melasma is a persistent and recurrent pigmentation disorder. It is a skin condition that affects facial skin aesthetics and can lower self-esteem, causing emotional distress, which can lower a person's quality of life.[5] **Aim:** Correlation of melasma quality of life index (Hi-MELASQOL) in relation with melasma area severity index (MASI) and to analyze the different patterns and influence of melasma on life quality. **Methods :** This was a cross-sectional study involving 100 subjects. Hi-MELASQOL questionnaire comprising of 10 items was used to assess the patient's quality of life (QoL). MASI score was used to determine the severity of melasma. All the collected data were recorded, processed and statistically analyzed using Epi Info2000 and SPSS Inc 20.0. **Results:** Significant association was observed between the Hi-MELASQoL and MASI scores. It was evident that melasma had an adverse impact on the patients' quality of life. Association between MASI Score and type of melasma had a p value<0.05 and hence showed a statistically significant association between them. However, association between Hi- MELASQOL Score (individually & total) and type of melasma was statistically insignificant. The most common type was centrofacial (71%) followed by malar (25%) and mandibular (5%). **Conclusion :** There was a significant impairment in the quality of life in our study population due to melasma as assessed by Hi-MELASQOL and MASI Score. Utilization of Hi-MELASQOL scale should be considered in evaluation of quality of life of patients affected with melasma.

INTRODUCTION

A common acquired pigmentation disorder known as melasma causes irregular, hyperpigmented brown to greyish brown patches or macules on the face.[1] Melasma is a major cause of psychological distress in the affected patients and they commonly suffer from low self-esteem, dissatisfaction, and decreased motivation to step out.[2] Melasma's impact on quality of life cannot be assessed solely on the severity of the disease, as patient characteristics also have a significant impact which is primarily reflected in their mental health, so an objective assessment that is sensitive to patient's needs and psychological comfort is required.[3,4]

Hindi-Melasma quality of life index and melasma area severity index were thus used in the current study to examine how melasma affects patients' quality of life and whether they have any significant correlation amongst themselves.

MATERIALS & METHODS

This cross-sectional study was carried out from June 2021 to May 2022 on 100 patients attending the Department of Dermatology at our institute, after obtaining ethical clearance from the institution. After obtaining their informed consent, demographic data along with the relevant medical history was recorded.

Inclusion criteria:

1. Patients (males and females) presenting with clinical diagnosis of melasma.
2. Patients who were already on treatment for melasma.

Exclusion criteria:

1. Pregnant females or with previous pregnancy within last 6 months.
2. Patients on medication which can cause pigmentation such as amiodarone, anti-malarial drugs, chlorpromazine.
3. Patients with other systemic diseases associated with hyperpigmentation such as SLE and Addison's disease.
4. Patients on dermatological treatment like microdermabrasion, chemical peeling and laser treatment.
5. Patients presenting with hyperpigmented macules/ patches present since birth.
6. Patients who are a known case of thyroid dysfunction.

The severity of melasma in each patient was determined using Melasma Area Severity Index (MASI). Melasma Area Severity Index score of all the participants was calculated using formula, MASI score = 0.3A(f) (D[f] + H[f]) + 0.3A(lm) (D[lm] + H[lm]) + 0.3A(rm) (D[rm] + H[rm]) + 0.1(c) (D[c] + H[c]), and ranges from 0 to 48; where subjective assessment of three factors is taken: area (A) of involvement, darkness (D), and homogeneity (H). The face is divided into four regions: forehead (f), right malar (rm), left malar (lm), and chin (c); the first three weighted 30% each and chin, 10%. The area of involvement in each of these 4 facial regions is given a numeric value of 0–6 (0 = no involvement; 1 = <10%; 2 = 10%–29%; 3 = 30%–49%; 4 = 50%–69%; 5 = 70%–89%; and 6 = 90%–100%). Darkness and homogeneity are rated on a scale from 0 to 4 (0 = absent; 1 = slight; 2 = mild; 3 = marked; and 4 = maximum).[5]

After taking detailed history, Hindi-Melasma quality of life index (Hi-MELASQOL) questionnaire which included 10 items (Table 1) was given to patients. It analyzes on Likert scale of 1 to 7 (1, signifying not bothered at all and 7, bothered all the time); thus ranging from 10 – 70. Higher the score, worse is the quality of life (QoL).[6]

Mean, percentages, range and standard deviation were used for quantifiable variables. Proportion, Chi square test was applied for qualitative variables. A two-tailed probability value of less than 0.05 was considered statistically significant. Statistical analysis was

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performed using Epi Info2000 and Statistical Package Social Sciences student version 20.0 (SPSS Inc, Chicago, USA).

Table 01: MELASQOL scale

	On a Likert scale of 1 (not bothered at all) to 7 (bothered all the time), the subject rates how he/ she feels about:
1	The appearance of your skin condition
2	Frustration about your skin condition
3	Embarrassment about your skin condition
4	Feeling depressed about your skin condition
5	The effects of your skin condition on your interactions with other people (e.g. interactions with family, friends, close relationship, etc.)
6	The effects of your skin condition on your desire to be with people
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

* MELASQOL, Melasma quality of life

RESULTS

Our study population comprised of 86 females and 14 males with ages ranging from 16 to 60 years, with a mean of 32.72±7.9 years. All the patients included in our study had a gradual onset and slow progression of the lesions. None of the patients had a significant family history. Corticosteroid usage present in 41% of patients was the numero uno aggravating factor. Sixty nine percent patients had cosmetic history in comparison to 31% not having it. The frequency for shape were viz. circular 52%, irregular 38% and oval 10%. 76% presented as macules in contrast to 24% presenting as patches. Well defined lesions were 52% and ill-defined were 48%. Sixty three percent presented with regular surface contrasted with 37% having irregular surface. All the patients (100%) included in our study had hyperpigmentation. A positive history of sun exposure was present in 33% of our study subjects. Descriptive statistics of Hi-MELASQOL (Individual and total) Score and MASI Score is depicted in table 2 and 3. Skin type IV is the most frequent (61%) in our study followed by V (32%) & III (7%). Centrofacial (71%) accounts for the most common type of melasma in our study followed by malar (25%) and mandibular (5%). The most frequent pattern as observed under Wood light examination was epidermal (82%). Eighteen percent had dermal pattern.

Table 02: Descriptive statistics of Hi-MELASQOL (Individual and total) Score:

	Mode	Median	Mean	Std. Deviation	IQR	Variance	Minimum	Maximum
M1 Hi-MELASQOL	6	6	5.86	1.054	2	1.112	2	7
M2 Hi-MELASQOL	7	6	5.66	1.224	2	1.499	2	7
M3 Hi-MELASQOL	6	6	5.57	1.335	1	1.783	0	7
M4 Hi-MELASQOL	6	6	5.49	1.227	1	1.505	2	7
M5 Hi-MELASQOL	6	5	5.14	1.57	2	2.465	0	7
M6 Hi-MELASQOL	6	5	4.73	1.774	2	3.149	0	7
M7 Hi-MELASQOL	5	5	4.64	1.894	2	3.586	0	7
M8 Hi-MELASQOL	5	5	4.96	1.746	2	3.049	þ	7
M9 Hi-MELASQOL	5	5	4.76	1.81	2	3.275	0	7
M10 Hi-MELASQOL	6	6	5.14	1.621	2	2.627	0	7
Hi-MELASQOL Total	54	53	51.95	10.368	11.25	107.503	12	68

* Hi-MELASQOL, Hindi-Melasma quality of life

Table 03: Descriptive Statistics of MASI Score

	MASI SCORE
Mode	18
Median	19.2
Mean	19.272
Std. Deviation	5.786
IQR	7.15
Variance	33.475
Minimum	6.8
Maximum	35.4

* MASI, Melasma Area Severity Index

Pearson's Correlation test was used to determine the correlation between all parameters of Hi-MELASQOL 1 to 10 and Hi-MELASQOL total with MASI score. Statistically significant correlation was observed between M5, M8, M10, and Hi-MELASQOL total with MASI score. However, M1, M2, M3, M4, M6, M7, and M9 did not show any statistically significant correlation with MASI score. Pearson's Correlation test was used to determine the correlation between all parameters of Hi-MELASQOL 1 to 10 and Hi-MELASQOL total with age of the patient. No statistically significant correlation (p value>0.05) was found between Hi-MELASQOL and the age of the patient.

Student t test was conducted to study the association between Hi-MELASQOL (individually and total) and Sex. It did not show any statistically significant association between them. Association between Hi-MELASQOL Total score and aggravating factors was p value >0.05, therefore showed a statistically insignificant association between them. ANOVA test performed to test association between Hi-MELASQOL total score and type of melasma had a p value>0.05 and hence did not show any statistically significant association between them. In our study no statistically significant association was observed between altitude and MASI score (p value=0.4). Statistically significant association (p value < 0.05) was observed between the MASI Score and type of melasma.

Student t test t used to analyze the association between MASI and reaction to sunlight, had a p value of 0.22 and hence did not show any association between them among our study population. Statistically significant association between (p value<0.05) MASI score and sex was noted. Chi squared test was performed to test the association between type of melasma and sex and also between type of melasma and skin type. It had a p value<0.05 and therefore, both showed a statistically significant association between them.

The most common occupation in our study was housewife (40%) trailed by farmer (17%), staff nurses (14%) and private job (10%). Chi squared test was used to test the significance of association between Occupation and the type of melasma observed in the patients. It had a p value of 0.04 and therefore there was a statistically significant association between them. Student t test was performed to test the association between MASI score and aggravating factors (history of corticosteroid usage) ant it yielded statistically insignificant association (p value> 0.05).

DISCUSSION

Women are more likely than men to experience melasma. It produces severe psychological distress. Due to changes in self-perception, a decline in confidence, and a worsening of mood, it has an impact on daily life and eventually reduces social engagement, which has a detrimental effect on life quality in general. It frequently recurs and necessitates ongoing therapy.[1,2]

With a mean age of 32.72 years, the age range of the patients in our study was 16 to 60 years. The majority of the patients were between second to third decades comprising 84% of the study population. This was consistent with a multicentric study conducted in India with 1001 patients in which the mean age of patients was found to be 30.19 years in the population of North region.[7]

The ratio of both the sexes in our study was approximately 6:1 (86 females and 14 males). In a different study conducted in India Sarkar R et al in 2003 recruiting 120 patients, the ratio was revealed to be approximately 4:1.[8] Because of the known multifactorial etiology of melasma which is known to affect females more than males, therefore, the number of females in our study outnumbered the males.

In our study, 71% of patients had melasma of the centrofacial type (66% females; 5% males), 24% had malar type (15% females; 9% males), and 5% had mandibular pattern type (5% females). No patients included in our study had mixed pattern of melasma. This was in concordance with an Indian study conducted by Achar A et al in 2011 in which 55% patients had centrofacial variety of melasma.[9]

The most frequent pattern under the Wood's light examination was

epidermal, which was seen in 82 patients. In 18 cases, the pattern was dermal type. In our study, there were no cases of mixed type. These findings were in contrast to the findings revealed in study by Achar A et al where dermal was the most frequent pattern seen; in 67 and 75 cases, epidermal and mixed types of patterns were present respectively.[9] The discrepancy in our study's findings may be the result of patients seeking early medical advice because of concerns about cosmesis.

Statistically significant association was seen between type of melasma and skin type. In our study, 71% of patients exhibited melasma of the centrofacial type (2% skin type III, 43% skin type IV, and 26% skin type V), 24% had melasma of the malar type (2% skin type III, 16% skin type IV, and 6% skin type V), and 5% had melasma with a mandibular pattern (3% skin type III and 2% skin type IV).

In our study, skin type IV (61%) was most predominant and it was commensurate with a Brazilian study where 38.4% had skin type IV.[10] A small number of study participants had skin type III (7%) because our study was conducted in hilly areas where patients have fairer skin as compared to planes.

A history of aggravation on exposure to sunlight was documented in 33% of the population in our study which was also reported by 55.5% of cases included in study conducted by Achar A et al in 2011.[9] This discrepancy was likely because the average duration of exposure to sunlight per day was subjectively quantified for every patient according to their responses.

There was no significant family history in all the patients included in our study. This was in contrast to the same Indian study which reported a positive family history in approximately 33.33% of participants.[9] Statistically significant relationship (p value of 0.04) was observed between the type of melasma and occupation in our study. The reason could be, housewives (40%) who were exposed to cooking heat for a longer period of time, experienced greater severity. In contrast to this, study conducted by Shenoi SD et al, 41% of rice field labourers were found to be affected by the condition.[11] Pearson's Correlation test was used to determine the correlation between all parameters of Hi-MELASQOL 1 to 10 with MASI score. Mean Hi-MELASQOL score was 51.95 out of 70. The mean MASI score was 19.272±5.786. Therefore, there was a significant impairment in the quality of life in our study population due to melasma. Our results were consistent with the results of a study conducted by Sarkar R et al which also showed a strikingly strong association between the MASI and Hi-MELASQOL scores. The mean MASI score was 20.0±7.5, and the Hi-MELASQOL score was 37.19 ±18.15. These two scores were considerably, highly, and favorably linked with one another.[12] Our findings were in contrast with a study performed by Freitag FM et al, where MELASQOL and MASI score did not correlate well. This finding suggests that the patient's subjective experience of the condition goes beyond the clinical aspect of dyschromia.[13] A higher mean Hi-MELASQOL score was obtained in our study likely because of the greater proportion of educated participants.

Statistically significant correlation was observed between M5, M8, M10 parameters, and Hi-MELASQOL total with MASI score as described in result earlier. No statistically significant association was found between Hi-MELASQOL and the age of the patient. These findings were most likely caused by the fact that only 19 out of 100 patients were between the ages of 16 and 25 who are more concerned with their physical appearance.

No significant association was observed between Hi-MELASQOL (individually and total) and Sex. However, Hi-MELASQOL in our study was found to be higher in females as compared to males. This was in odds with the study conducted by Kothari P et al in 2018 where surprisingly, the MELASQOL score was found to be higher in men than in women.[14] These results were most likely a result of the majority of patients in our study being females, who place greater importance on cosmesis. However, the results were not statistically significant because 40% of them were housewives.

No significant association was noted between Hi-MELASQOL Score (individually and total) and type of melasma. This result might be due to socio-cultural and geographic differences. But, a statistically significant association between MASI Score and type of melasma was seen. This was probably because the centrofacial type (mean MASI of centrofacial type 23.32) of melasma involved a larger surface area than the malar and mandibular variant. The predominant malar (69.5%) pattern in a study by Kothari P et al. in 2018 may be responsible for the lower mean MASI score (9.07)[14]

Significant association between MASI and sex was seen with mean MASI in females being 19.9 and in males 15.1. These findings were similar to the findings from previous studies conducted by by Pandya AG et al in 2011.[5]

Student t test was used to analyze the association between MASI and reaction to sunlight. It had a p value of 0.22 and hence did not show any association between them among our study population. This is consistent with the results of a study conducted by Zainuddin F et al in 2016.[15]

Association of altitude with Hi-MELASQOL and MASI did not yield any significance in our study. Since it is well known that UV radiation is more intense in hilly areas, this factor was taken into account in our study. The most common aggravating factor documented was a history of topical corticosteroid usage (41%). This outcome was obtained as a result of the patients receiving topical corticosteroid treatment experiencing remission followed by relapse, along with other possible corticosteroid side effects.

The limitations of this study were that it was a single centre cross-sectional observational study. The possibility of memory and recall bias is important, particularly in light of historical factors like the duration of the disease, the age at onset, the site of onset, the duration of exposures, prior treatment regimens for melasma, etc. The study population in our study was not divided into urban and rural categories.

The correlation of MASI was not correlated with the age and skin type of the patient. The association of melasma with other concomitant conditions like autoimmune disorders, anaemia, patients on combined oral contraceptives, pregnancy, PCOS and/ or hirsutism was not studied.

Further studies are warranted to evaluate the detrimental effects of melasma on the quality of life of patients using MELASQOL index in the regional languages.

CONCLUSION

Melasma has an adverse impact on patient's QoL. While the disease may be treated well as per its severity, improvement in QoL requires an objective assessment that is sensitive to patient's needs and psychological comfort. Utilization of Hi- MELASQOL scale in probing the QoL and its correlation with MASI has been significant. To accurately represent the disease burden, it is crucial to translate and validate this into other languages.

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