ORIGINAL ARTICLE

Melasma and its Association with Serum Iron Levels and Complete Blood Count

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ABSTRACT

Objective: To observe association of Melasma with serum Iron and complete blood count indices
Study Design: Case-control cross-sectional study
Place and Duration of Study: Department of Dermatology, HIT Hospital Taxila from 1st May 2021 to 1st October 2021
Methodology: Fifty seven females having melasma were taken as cases and 48 non-pregnant females without melasma as control between 12-50 years of age. Women with pregnancy, history of cardiac or thyroid disease and usage of hormone therapy, phototoxic drugs or anti-convulsant drugs were not included. History and examination was done by a dermatologist. Modified MASI (m Melasma Area and Severity Index) score was used for assessing severity of melasma. Blood samples were collected and send for serum Ferritin level, TIBC and Complete blood count in both groups.
Results: The mean age of females were 35±7.4 years, and 48 female patients with no melasma were selected as controls with mean age of 25.7±8.4 years. We also analyzed the effect of different hematological and general factors on mMASI score within group of melasma patient but again found no statistically significant effect of any of these on MASI score.
Conclusion: There is no direct association between melasma, serum iron levels and blood indices.
Keywords: Melasma, Serum ferritin levels, Complete blood count

INTRODUCTION

Melasma is a common skin condition in south Asian countries. Majority of the population in this region have skin type III and IV which is more prone to hyperpigmentation as compare to type II. Likewise, melasma is frequently seen in this region. It is characterized by bilateral irregular brown macules and patches on sun exposed areas of the face.[1] The disorder is usually found in women, particularly seen in reproductive age, and in darker skin types, such as Hispanics, Asians, and African Americans. Melasma has a detrimental impact on a patient's quality of life. Melasma is a cosmetic problem, and in femalephysical attractiveness affects their social as well as emotional wellbeing and their daily activities.[2]

Centro-facial, malar and the rare mandibular pattern are seen in clinically. However, there is a significant overlap in many patients. Sanchez et al[3] suggested the subdivision of melasma into epidermal, dermal and mixed types, depending on the depth of skin involvement.

Exact etiology of melasma is unknown. However, etio-pathogenesis of melasma is multifactorial and complex in nature. Nevertheless, two sets of factors seem to be involved endogenous factors, in which genetic susceptibility and cutaneous vasculature are important, and exogenous stimuli such as sex hormones and UV irradiation play significant role in melano-genesis.[4] In order to have an insight about the dynamics of disease, serum parameters, like zinc, iron, copper, and magnesium have also been investigated as having correlated with skin lesions and melasma.[5] Prevalence of iron deficiency anemia and melasma is high in females of reproductive age, this draw the attention of physicians to correlate iron deficiency anemia with melasma. Moreover, iron deficiency anemia intensifies hyperpigmentation. Recently relation between melasma and iron deficiency anemia has been established with low serum levels of hemoglobin (Hb), iron, ferritin and total iron binding capacity (TIBC) in patients with melasma.[6,7]

Hence, keeping in view the recent studies on the role of iron deficiency as reflected in complete blood count and its relation with melasma we plan to evaluate serum iron profile and complete blood count in patients of melasma to see whether these indices in our melasma patients were parallel to what is expected in iron deficiency.

MATERIALS AND METHODS

This is across sectional study done in Dermatology Department of HIT hospital Taxila from 1st May 2021 to 31st October 2021. This study included female between 12-50 years of age through convenience sampling technique. 57 females having melasma were taken as cases and 48 non-pregnant females without melasma as control. Women with pregnancy, history of cardiac or thyroid disease and usage of hormone therapy, phototoxic drugs or anti-convulsant drugs were not included.

After taking the verbal consent and explaining the purpose of research in Urdu. History and examination was done by a dermatologist. mMASI (Melasma Area and Severity Index). Score was used for assessing severity of melisma. Total mMASI score range is 0 to 24 and calculated by adding scores for 4 areas of the face. Scoring Key: mild = <8, moderate = 8-16, severe = >16. Blood samples were collected and send for serum ferritin level, TIBC and Complete blood count in both groups.

Data was analyzed by SPSS 23 for Windows. Descriptive Statistics were calculated for demographic variables. Means were compared using independent t-test and proportions were compared using Chi-square test. Crude and adjusted odds ratios were calculated along with 95% confidence intervals.

RESULTS

A total 57 patients presenting in dermatology OPD with complaint of melasma were selected, all were female with mean age of 35±7.4 years, and 48 female patients with no melasma were selected as controls with mean age of 25.7±8.4 years. Out of 58 cases, 55 (96.5%) were married and among controls 26 (54.2%) were married (Table 1).

Mean duration of melasma at the time of presentation found to be 3.7 years with maximum 18 yrs. to minimum 5 months. Mean MASI score found to be 1.81. Different hematological variables were compared between cases and controls. On comparison of mean, Hb, MCV and MCH and TIBC found to be low in cases than in controls but Ferritin was high in cases than in controls (Table.2)

When we apply Chi-Square to compare for hematological variables between two groups, there was no statistically significant difference between two groups (Table.3). We also analyzed the effect of different hematological and general factors on MASI score

within group of melasma patient but again found no statistically significant effect of any of these on MASI score (Table 4).

Table 1: Comparison of general characteristics of groups

Characteristics	Cases	Controls
Mean age	35±7.4	25.7±8.4
Marital status		
Married	55 (96.5%)	26 (54.2%)
Unmarried	2 (3.5%)	22 (45.8%)
Skin Type		
3	28 (49.1%)	36 (75%)
4	29 (50.8%)	12 (25%)

Table 2: Comparison of mean hematological variables between cases and controls

Hematological variable	Cases	Controls
Hemoglobin	11.74	12.04
MCV	76.46	77.27
MCH	26.75	27.18
MCHC	34.63	34.92
Ferritin	42.39	28.30
TIBC	67.88	74.50

Table 3: Comparison of hematological variables between groups

Variable	Cases	Controls	P value
Hemoglobin			
Very low	9	4	
Low	21	21	0.29
Normal	27	21	
High	-	2	
MCV			
Very low	5	5	
Low	22	11	0.23
Normal	30	31	
High	-	1	
MCH			
Low	32	19	
Normal	25	27	0.08
High	-	2	
MCHC			
Low	6	5	
Normal	20	10	0.25
High	31	33	
Ferritin			
Low	10	11	
Normal	47	37	0.32
High	-	-	
TIBC			
Low	1	-	
Normal	50	36	0.06
High	6	12	

Table 4: Effect of different hematological variables on MASI score

Variable	MASI score			P value
	Mild	Moderate	Severe	
Skin Type				
3	11	16	1	0.11
4	6	18	5	
Duration				
<3	11	16	5	
3-6	6	12	-	0.25
7-10	-	4	1	
>10	-	2	-	
Hemoglobin				
Very low	4	5	-	
Low	3	13	5	0.09
Normal	10	16	1	
MCV				
Very low	3	2	-	
Low	6	13	3	0.69
Normal	8	19	3	
MCH				
Low	9	19	4	0.92
Normal	8	15	2	
MCHC				
Low	3	3	-	
Normal	4	13	3	0.64
High	10	18	3	
Ferritin				
Low	4	6	-	0.59
Normal	13	28	6	
TIBC				
Low	-	1	-	
Normal	15	29	6	1.00
High	2	4	-	

DISCUSSION

In our study 57 patients presenting in dermatology OPD with complaint of melasma were selected, all were female with mean age of 35±7.4 years, and 48 female patients with no melasma were selected as controls with mean age of 25.7±8.4 years which is comparable to that seen in a studies by Behrangi[8] and Azadeh et al.[7]

Out of 58 cases, 55 (96.5%) were married and among controls 26(54.2%) were married that was parallel to seen in a study by Azadeh et al.[9] Hence, it can be stated that melasma is a disorder of child bearing age group in which hormonal changes, UV exposure and pregnancy is far more common.

In our study, hematological variables were compared between cases and controls. On comparison of mean, Hb, MCV and MCH and TIBC found to be low in cases than in controls but ferritin was high in cases than in controls. As far as the hematological variables are concerned, there was no statistically significant difference found between two groups. We also analyzed the effect of different hematological and general factors on MASI score within group of melasma patient but again found no statistically significant effect of any of these on MASI score.

Different studies have been done to establish the relationship between melasma and iron levels at the same time enormous variation in results have been observed. A retrospective study done by Asma et al[10] analyses the serum ferritin levels and thyroid profile found no association between the melasma and iron levels. Similarly, a case control study done in Iran evaluated the relationship between melasma, serum ferritin level B12 and folate levels but found no weighty association. In contrary to this, Qazi et al[11] conclude in their case control study on 140 females a clear link between melasma and iron levels but at the same time suggested use of larger sample size. This study also found a direct link between severity of melasma and iron levels.

Likewise, a case control study by Nallan et al[12] comprises of 192 participants showed that melasma patients have mean hemoglobin levels low as compare to control but even then this study could not establish substantial link between melasma and low hemoglobin level.

Since melasma etiology is multidimensional also histological features seen are heterogenous in nature including role of mast cells, basement membrane disruption, increased in vascularization and solar elastosis all are implicated in melasma.[13] We cannot rely on serum iron levels as a single factor when at the same time exogenous factors like UV light has a document role in the initiation and flare up of melasma.[14] Alone exogenous or endogenous factors are difficult to evaluate but larger sample size can be used to further investigate relation between iron and melasma.

Advance research in this regard will not only make available more evidence for the pathophysiology of melasma, but also open new horizon to targets for advances in newer treatment modalities.

CONCLUSION

There is no direct association between melasma and serum iron levels and blood count indices.

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