



RELATIONSHIP OF IRON DEFICIENCY ANAEMIA AND THYROID ABNORMALITIES WITH MELASMA IN FEMALES: A HOSPITAL BASED DESCRIPTIVE STUDY

Mubashar M Mir and Mashkoor Ahmed Wani*

Department of Dermatology, Government Medical College Jammu

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ABSTRACT

Background: Melasma is a common cause of acquired and localised facial hypermelanosis primarily affecting females. Its association with iron deficiency anaemia and thyroid abnormalities has been studied in the past with inconsistent results in various studies. The aim of this study was to determine the relationship of Iron deficiency anaemia and thyroid abnormalities with melasma in females and to compare it with severity of melasma (MASI). It was a hospital based descriptive study conducted in a tertiary care of North India.

Methods: Data was collected from one hundred fifteen on pregnant females of melasma presenting to the OPD. Investigations including Hb, serum ferritin and TSH was done.

Results: The mean age at presentation was 31 years. Anaemia was present in 29% cases of melasma with mean Hb level of 10.9 g/dL. Mean serum ferritin level was 21.3 ng/ml. Mean TSH was 2.75 mIU/ml and was in normal range in over 96% of the patients.

Conclusions: Iron deficiency anaemia was found to be associated with Melasma and showed a direct correlation with severity of melasma however thyroid dysfunction (TSH) showed no association with melasma in our study.

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INTRODUCTION

Melasma also known as chloasma is a common, acquired cause of hyperpigmentation affecting females in the form of tan or dark brown coloured symmetrical pigmentation involving sun exposed sites primarily the face and occasionally the forearms.¹ The exact etiopathogenesis of melasma still remains obscure however its association with various factors like ultraviolet radiation, genetic predisposition, pregnancy, use of oral contraceptive and hormonal drugs, thyroid diseases, anaemia, cosmetics, phototoxic medications and ovarian tumours has been reported.² Melasma presents in three clinical patterns of distribution on the face i.e. Centro facial (most common) affecting forehead, nose, upper lips and chin; Malar affecting the nose and cheeks and finally the Mandibular subtype affecting the mandibular ramus area.³ Various blood parameters like zinc, iron, copper, and magnesium have been associated with melasma.⁴ However there is paucity of data with regards to association of melasma with iron deficiency states and endocrinal factors especially thyroid dysfunction. Studies whatever available reveal inconsistent findings. Hence this study was conducted to assess the relationship of Iron deficiency anaemia and thyroid dysfunction with melasma in females.

MATERIALS AND METHODS

It was a hospital based cross sectional study conducted in the Department of Dermatology, Venerology and Leprology of Government Medical College Jammu from June 2019 to December 2019. The study group comprised of 115 females attending skin OPD for melasma. Clinically diagnosed female patients of melasma were included in the study. Exclusion criteria consisted of pregnant females, patients on oral contraceptive drugs or hormonal therapy, antiepileptic medication and patients with menstrual irregularities. A brief history and medical examination were performed. Melasma area and severity score (MASI) was calculated in each case to determine the clinical severity. Wood's lamp examination was done in selected cases. Blood Investigations including Haemoglobin (Hb), serum ferritin and Thyroid stimulating hormone (TSH) were done in all cases.

Statistical analysis

Data was analysed using Microsoft Excel and Statistical Product and Service Solutions (SPSS 22.0). Numerical data was calculated in the form of mean, standard deviation and categorical data as frequencies and proportions. Student's independent t-test was employed for comparison of continuous variables. Chi square test was used to test association between categorical variables. Correlational analysis between continuous variables was done using Karl Pearson correlation coefficient. p value of <0.05 was taken as significant.

*Corresponding author: Mashkoor Ahmed Wani

Department of Dermatology, Government Medical College Jammu

RESULTS

The age of patients ranged from 22 to 53 years (mean 31.04±SD 6.63 years). 29 % patients had anaemia (Haemoglobin level Hb < 12g/dL). Mean Hb level was 10.91±SD 1.62 g/dL whereas Serum ferritin levels ranged between 8.00-97.00 mean ferritin was 21.29±20.08. TSH level varied from 0.58 to 11.43 mIU/ml with a mean value of 2.75 ± SD 2.52. The correlation between the severity of melasma (MASI) with the haemoglobin and serum ferritin was also studied which showed a negative correlation between MASI and Hb ($r = -0.206$; $p = 0.0194$) and MASI and serum ferritin ($r = -0.32$; $p = 0.008$). However, MASI showed no significant correlation with TSH levels ($r = 0.013$; $p = 0.580$).

Table 1 Clinico-investigative parameters of melasma patients

Feature (n=115)	Range	Mean±SD
Age (yrs.)	22 - 53	31.04±6.63
Haemoglobin (g/dL)	7.2-13.4	10.91±1.62
Ferritin(mcg/L)	8.00-97.00	21.29±20.08
TSH (mIU/ml)	0.58 to 11.43	2.75 ± 2.52

SD: Standard Deviation, TSH: Thyroid Stimulating Hormone

Table 2 Correlation between MASI and blood parameters

Parameter	Pearson Correlation (r)	p value
Haemoglobin (g/dL)	-0.206	0.0194*
Ferritin(mcg/L)	-0.320	0.008*
TSH	0.013	0.580

TSH: Thyroid Stimulating Hormone

DISCUSSION

The mean age of patients in our study was around 31 years. Similar age group predisposition was seen in previous studies signifying that melasma predominantly affects the females of young and middle age. This can be contributed by frequent use of hormonal drugs for contraception and prevalence of hormonal states like pregnancy in this age group.⁵ In our study, we found that melasma was associated with lower Haemoglobin and serum ferritin levels. Also, on comparing Hb and serum ferritin with severity of melasma (MASI score) we found significant negative correlation in both scenarios. Thus, suggesting that increase in Iron deficiency anaemia may in turn contribute to increase in the severity of melasma. Similar findings were observed by some previous studies.⁶ However many other studies found no such relationship between iron deficiency anaemia and melasma.^{7,8}

With regards to association of melasma with thyroid abnormalities, it was found that only four cases had increased TSH out of which two were already receiving levothyroxine orally whereas more than 96% were having normal TSH. Overall, no association between melasma and thyroid dysfunction was found. Also, on correlational analysis between MASI score and melasma no significant association was seen between the two. Some previous studies have pointed towards an increased prevalence of thyroid disorders in melasma patients.^{3,9} However, the findings of our study were contrary to these observations and in agreement with some other studies which showed no association between melasma and thyroid abnormalities.^{10,7}

It is thus concluded that Iron deficiency anaemia may contribute to causation of melasma especially in developing countries like India where iron deficiency anaemia is quite prevalent. Moreover, increase in severity of Iron Deficiency may correspond to increase severity of melasma. However, our study did not find any association of Thyroid abnormality with melasma. Limitations of the study included lack of control group, smaller sample size and that the effect of Iron supplementation on melasma was not studied.

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