

Determination of Hypothyroidism among Melasma Patients in Tertiary Care Hospitals

HINA MEHMOOD¹, FATIMA MOHSIN², AMNA SHAD³, SABAHAT ZULFIQAR⁴, MUHAMMAD HAMZA LAIQUE⁵, RIZWAN AHMAD⁶.

¹Department of Dermatology, Jinnah Hospital, Lahore-Pakistan

²Department of Physiology, Sialkot Medical College, Sialkot-Pakistan

³Department of medicine, MCH centre, Gujranwala-Pakistan

⁴Department of Anatomy, CMH Kharian Medical College, Kharian-Pakistan

⁵Department of medicine, Victoria Hospital, Bahawalpur-Pakistan

⁶Department of Ophthalmology, General Hospital, Lahore-Pakistan

Correspondence to Dr. Talha Laique, Assistant Professor of Pharmacology;. Email: talhalaique51@gmail.com Tel:+92-331-0346682

ABSTRACT

Background: Thyroid dysfunction can present as hyper-pigmented macular rash all over the face.

Aim: To determine the frequency of hypothyroidism or hyperthyroidism among patients presenting with rash over face in a tertiary care hospital.

Study design: It was a cross-sectional study

Methodology: With the sample size of 150 melasma patients, current study was carried out from September 2017 to March 2018 at the department of Dermatology, Jinnah Hospital, Lahore following the approval by Hospital's Ethical Committee. Early morning blood sample was taken from all enrolled patients fulfilling the inclusion criteria and sent to the lab for thyroid function test (FT4 and TSH). Thyroid dysfunction was categorized as hypothyroidism and hyperthyroidism. Data was entered and analyzed by Statistical Package for Social Sciences (SPSS software, version 21). Chi-square test was applied as p-value ≤ 0.05 was considered significant.

Results: In present study, patients (n=150) of both genders were included with the age ranging from 18-50 years. Among 150 patients, duration of melasma ranged from 1-6 years Results showed 26 (17.3%) had hypothyroidism whereas 03 (2%) had hyperthyroidism among enrolled patients. All cases of thyroid dysfunction were subclinical.

Conclusion: Females with moderate to severe melasma are more prone to have abnormal thyroid functions (subclinical hypothyroidism).

Keywords: Melasma; Thyroid Function Tests; Hypothyroid and Hyperthyroid.

INTRODUCTION

Melasma is an acquired, circumscribed hyper-melanosis of the face and occasionally of the neck and forearms. During pregnancy, it is known as the "mask of pregnancy"¹. It presents clinically as a symmetrical macular rash with darkening of skin having irregular borders. Lesions vary in number from one to multiple patches distributed all over the body. Pigmentation may be linear, or confluent. Young to middle aged females suffer from it mostly who belong from different ethnicities like Hispanic, Asian, Africans or Middle East descent that is darker skin prototypes².

Although it is not race specific disease but it occurs commonly in darker-skinned individuals of Oriental and Asian origin¹. Its reported prevalence is varied and ranges from 8% to 30% in Southeastern Asian populations. Extra-facial melasma is more prevalent in post-menopausal women^{1,2}.

It is a very common skin disorder, accounting for 0.25 to 4% of the patients seen in Dermatology Clinics in South East Asia, and is the most common pigment disorder among Indo Pak region^{3,4}. In one previous study held at Barzil in 2010, 1500 adults Brazilian patients were enrolled. In that study, pigmentation disorders were reported as the main cause of demand for dermatological care by 23.6% of men and 29.9% of women⁵.

In one previous study held at Nepal in 2008 enrolled

546 patients and concluded melasma as their 4th most common diagnosis⁶. In another study which observed 1076 patients concluded this pigmentary changes as the first most common dermatosis⁷. Another study concluded that the majority had a diagnosis of post-inflammatory hyperpigmentation, followed in frequency by melasma among 2,000 enrolled patients⁸.

There are many influencing factors like genetics, hormones level, ingredients in cosmetics, phototoxic, nutritional deficiency and exposure to UV radiation leading to its widespread globally. Its most cases are idiopathic affecting females mainly (9). It is commonly reported in females receiving oral contraceptives or hormone replacement therapy while males receiving estrogen derivatives for their prostatic cancer as treatment (10). Centofacial (65%), malar (20%), and mandibular (15%) are the main patterns of rash distribution¹¹.

Different regimes and laser therapies including intense pulsed light are being used for the treatment of melasma which are Kojic acid (3%)+Vitamin C (2%) cream, Azelaic acid (20%) cream, but none has been proven to be 100% effective⁴. It severely affects females socially, emotionally, economically as a treatment cost and creates mental as well as physical health issues.

Large number of patients have multiple disorders like thyroid dysfunction, asthma, CHF while presenting with skin disorders like rash over the body or face¹². Abnormal thyroid function may be another cause of rash or hyperpigmentation due to hormonal abnormalities which is a treatable. Due to limited literature previously, we planned

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this current study in the local population to see the frequency of hypothyroid/hyperthyroid patients having rash and hyper-pigmentation in our tertiary care hospitals. By treating and detecting thyroid disorders, we can reduce both the psychological and economic stress of the disease especially among females.

METHODOLOGY

It was a cross-sectional study conducted in Department of Dermatology, Jinnah Hospital, Lahore, Pakistan, from September 2017 to March 2018 following the approval by Hospital's Ethical Committee. The sample size of 150 was estimated by 95% confidence level and 7% margin of error while taking expected frequency of thyroid dysfunction to be 18.5% among melasma patients (12). Patients were enrolled by non-probability consecutive sampling. Diagnosed patients of melasma including both genders with age range (18-50 years) presenting to dermatology outdoor were enrolled. Exclusion criteria involved patients who were unable to give informed consent, taking anti thyroid drugs, having any organ failure/disease and pregnant. Written informed consent was taken from the patient at the time of enrollment. Early morning blood sample was taken and sent to the lab for thyroid function test (FT4 and TSH). Thyroid dysfunction was categorized as hypothyroidism and hyperthyroidism.

Statistical analysis: Data was entered and analyzed by Statistical Package for Social Sciences (SPSS software, version 21). Quantitative data like age (in years), serum T4 and TSH were presented as Mean \pm S.D. The categorical data like gender, Thyroid dysfunction (hypo or hyperthyroidism) were offered as frequency and percentages. Modifiable factors like gender and severity of

disease were controlled by stratification of data. Chi-square test was applied as p-value \leq 0.05 was considered significant

RESULTS

Among 150 enrolled patients, age ranged from 18-50 years. Demographic parameters were shown in table:1 that were noted at the time of enrollment. Thyroid dysfunction was observed in 29 (19.3%) patients as summarized in table-2 below. It was subclinical in all the patients enrolled in current study. Results were summarized in table-3 below that were insignificant for gender and severity of disease stratification.

Table-1: Baseline Characteristics of Melasma Patients (n=150)

	Frequency	%age
Male	23	15.3
Female	127	84.7
Age Groups		
18-34	102	68
35-50	48	32
Duration of Melasma (years)		
1-3	97	64.7
4-6	53	35.3
Serum Markers		
	Range	Mean \pm SD
TSH (U/ml)	0.3-5.9	4.95 \pm 1.62
Free T4 (μ g/dl)	4.9-13.5	9.10 \pm 2.74

Table-2: Frequency of Thyroid Dysfunction of Melasma Patients (n=150)

Thyroid Dysfunction	Frequency	%age
Yes	29	19.3
Hypothyroid	26	17.3%
Hyperthyroid	3	2.0%
No	121	80.7

Table-3: Comparison of Frequency of Thyroid Dysfunction across Various Groups

	Thyroid Dysfunction		Total	P value
	Yes (n=29)	No(n=121)		
Males	6 26.1%	17 73.9%	23 100%	0.373
Females	23 18.1%	104 81.9%	127 100%	
Total	29 19.3%	121 80.7%	150 100%	
Severity of Disease				
Mild	5 16.1%	26 83.9%	31 100%	0.87
Moderate	12 19.7%	49 80.3%	61 100%	
Severe	12	46	58	
	20.7%	79.3%	100%	

DISCUSSION

In the present study, the mean age of the patients was 31.07 \pm 8.91 years. A similar mean age of 30.28 \pm 8.08 years has been reported by Murtaza et al. (2016) among such patients presenting at Lady Reading Hospital (LRH), Peshawar¹³. Yazdanfar et al (2010) reported similar mean age of 30.04 \pm 6.72 years among such patients in Iranian population¹⁴.

There were 23 (15.3%) male and 127 (84.7%) female patients with a male to female ratio of 1:5.5. A similar

female predominance has been reported by Aamir et al. (1:6.1) and Murtaza et al. (1:5.7) among such patients in local population (13,15). In the present study, serum TSH level ranged from 0.3 U/ml to 5.9 U/ml with a mean of 4.95 \pm 1.62 U/ml while the serum free T4 level ranged from 4.9 μ g/dl to 13.5 μ g/dl with a mean of 9.10 \pm 2.74 μ g/dl. Yazdanfar et al. (2010) reported similar mean serum TSH (2.70 \pm 1.83 U/ml) and FT₄ (7.64 \pm 1.28 μ g/dl) levels among melasma patients in Indian population¹⁴.

Thyroid dysfunction was observed in 29(19.3%) patients. It was hypothyroidism in 26(17.3%) patients and

hyperthyroidism in 3 (2.0%) patients. It was subclinical in all the patients and there was no case of overt thyroid dysfunction. A similar frequency of thyroid dysfunction was observed by Mogaddam et al. (18.5%) in Iranian such patients¹². They also reported similar frequencies of hypo- (17.1%) and hyper- (1.4%) thyroidism. In our study severity of melasma and gender were insignificantly related to thyroid dysfunction with p-value >0.05. A much lower frequency of thyroid dysfunction was observed by Ikino et al¹⁶.

Our study had a number of limitations like financial constrains and less resources. We didn't correlate the outcomes of treatment in such patients with and without thyroid dysfunction.

CONCLUSION

Females with moderate to severe melasma are more prone to have abnormal thyroid functions (subclinical hypothyroidism). Hence, it is recommended to evaluate thyroid function tests as a routine in-order to lessen its burden from our society.

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