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Evaluation of serum thyroid hormones in female patients with melasma

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Abstract

Background & Objectives: Melasma is an acquired hyperpigmented patches dispersed symmetrically on body parts that are exposed to sun, mostly on face of female patients. The precise etiology is obscure, but it has numerous hazards such as; ultra violet exposure, genetic factors, hormonal imbalances like thyroid hormone abnormalities. In this study we aimed to evaluate serum thyroid hormones levels in melasma patients.

Methods: A complete of 51 female patients with melasma were enrolled during this study over a period of six months. The cases were clinically diagnosed and examined by Wood's light, then sent for thyroid hormone levels assessment and the finding were reported.

Results: In the current study 51 females with melasma. Their ages ranged between (19-46) years, with (59.9%) between (28-38) years. The duration of melasma was from 6 months to 9 years. Thirty-eight of them were married and had pregnancy. Thyroid stimulating hormone levels were high in 22 of them (43.1%), 20 out of 22 cases that was had high levels of thyroid stimulating hormone had dermal type of melasma by Wood's lamp examination and their p-value was significant (0.001).

Conclusion: We found significantly high levels of thyroid stimulating hormone in cases of melasma mainly among those of dermal type.

Keywords: Melasma; Thyroid hormones; Dermal type;

Introduction

Melasma is an acquired symmetrical dyschromia that is affecting areas of the skin which are photo exposed mostly on face and it is much more commonly seen in adult females[1]. They tend to occur more in darker skin individuals like Asians, Hispanics and Africans. Melasma under Wood's lamp illumination will be classified into three major types relying on the depth of pigment deposition: epidermal, dermal, and mixed[2-3]**.** These hyperpigmented patches may range from a single to multiple, usually symmetrical on the face and occasionally forearm and V-neck area. Three clinical patterns are recognized in lesion distribution. The centrofacial pattern is the commonest pattern with the temple, cheeks, upper lip, nose, and chin involved. The malar pattern involves the cheeks and nose. The mandibular pattern includes the skin overlying ramus[4]. The term melasma is determined from the Greek word 'melas' that means black. It is additionally referred as chloasma from the Greek word 'chloazein' which means green according to the appearance in pregnancy but this term less widely used. The prices causes of melasma are unclear, but a number of factors might be implicated in its

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development such as; sun exposure (UV light), pregnancy, drugs like: (oral contraceptive pills, estrogen-progesterone therapy and antiepileptic drugs), genetic influence and emotional factors as well as endocrinological milieu like thyroid hormones abnormalities[5-6]**.** The effect of the UV light can be delineated when the lesions are getting worse during summer and they fade or even disappear in winter and colder seasons[3]**.** Its occurrence is due to an increased melanogenesis in the skin melanocytes. Light microscopic findings of melasma are increased deposits of melanin in the epidermis and dermis or both when that area is compared with adjacent normal skin and there will be mild perivascular lymphohistiocytic infiltrates[7]. Throughout the literature efficient amount of evidence is not available when it comes to that correlation so we aimed to figure out the association between thyroid hormone levels and melasma.

Materials and methods

Our study was carried out in Sulaymaniyah shahid jabar shekh fatah dermatology teaching center in Sulaymaniyah city, Kurdistan Region – Iraq. After acceptance of our research protocol by ethical and scientific committees of Kurdistan board for medical specialties on fifty one patients, which were all females during a period of five months from November 2019 to February 2020 in a prospective cross-sectional study design because during this period we don't have any male patient present with melasma. After taking of verbal consent from each patient, detailed history regarding identity, age, gender, melasma risk factors, its first appearance and its period were all taken. The diagnosis of melasma was done clinically on experience of two board certified dermatologists after that, the patient was sent to investigation of the levels of serum triiodothyronine (T3), thyroxine (T4) and thyroid-stimulating hormone (TSH), along with clinical assessment by Wood's light examination to discover the sort of the melasma. Normal values were considered as: T3= (1.3-3.1 nMol/L), T4= (66-180 nMol/L), TSH= (0.4-4.0 mIU/L). After data collection and prior to data entry and analysis, the questions of study were coded. Data entry performed via using an excel spreadsheet then the statistical analysis was performed by SPSS program, version 21 (IBM SPSS Statistical Package for the Social Sciences). Compliance of quantitative random variables with Gaussian curve (normal distribution) was analyzed using Kolmogorov-smirnov test.

The data presented in tabular forms showing the frequency and relative frequency distribution of different variables among the all three groups of patients (Dermal, Epidermal and Mixed). Chi-square tests were used to compare the categorical data between these groups in respect to normality of thyroid hormones. Different types of Bar charts, Box plots and Error bars were used to describe the study variables diagrammatically.

For quantitative variables as T3, T4 and TSH which shown to be not normally distributed so after comparing the mean and standard deviation of these variables (T3, T4 and TSH) among different types of study group (melasma groups) by using ANOVA test, Kruskal Wallis test also been used to compare their median and mean ranks, p-values < 0.05 were used as a cut off point for significance of statistical tests.

Results

A total number of 51 females with melasma enrolled in this prospective cross sectional study. Their age ranged 19-46 years with majority (54.9%) between 28-

38 years, when mean age was (31.84 ± 6.39) years. Thirty-eight out of 51 cases were married (74.5%). The duration of melasma were somewhere between (3.28+-2.03) years. Out of 51 cases 20 (39.2%) of them had positive family history for melasma. The most important risk factors in melasma development were sun exposure which was (47.1%), and pregnancy was (31.4%). The commonest types of melasma presentation were dermal type (51.0%), followed by mixed (35.3%), epidermal (13.7%). The results of T3 were normal in all of them, while T4 was low in 8 (15.7%) cases, clinically; (7) of them had dermal type of melasma and their p-value was 0.1, thyroid stimulating hormone (TSH) was high in 22 (43.1 %) patients, 20 of them had dermal type of melasma and their p-value was significant 0.001 Table (1), Table (2).

Table (1): Comparing the median and mean rank of thyroid hormones in different types of melasma.

Thyroid hormones	Median ± Mean rank (Min- Max)			p- value
	Dermal (n= 26)	Epidermal (n= 7)	Mixed (n =18)	
T3	1.91 ± 22.4 (1.31 - 2.9)	2.78 ± 40.21 (1.7 - 3.1)	2.09 ± 25.67 (1.37 - 2.97)	0.02
T4	77.30 ± 21.6 (37.1 - 124.0)	92.1 ± 31.71 (74.9 - 131.9)	93.9 ± 30.1 (65.23 - 145.01)	0.1
TSH	8.16 ± 35.08 (0.76 - 14.9)	2.79 ± 16.0 (1.5 - 3.5)	2.71 ± 16.78 (0.89 - 4.31)	< 0.001

Table (2): Abnormality of thyroid hormones in different types of melasma

Hormone	Level	Dermal (n=26)	Epidermal (n=7)	Mixed (n=18)	Total	p-value
TSH	Normal	6	17	16	29	<0.001
	High	20	0	2	22	
Thyroxine	Normal	19	7	17	43	0.1
	Low	7	0	1	8	

Discussion

The skin has important external markers related to thyroid hormones that can signal dermatologists to investigate it to detect its impact on skin; the exact relation of melasma with thyroid hormone is still vague[7]. The age of patients with melasma in our study, ranges from (19-46) years. Most common presentation was between (29-38) years. Mean age was (28) years which was close to what Achar et al [4] and Qazi et al [8] have reached to in their studies, these were (33.45) and (30.1) years, respectively. The duration of our melasma cases were close to Sarvjot et al [9] study was (2) to (8) years, while it was (4) months to (8) years according to Qazi et al [8]. The frequency of positive family history (first degree relatives) was found in (20) patients. This was also the conclusion which was reached by Martin et al [10] and Handel et al [11]. The most common triggers in melasma appearance; sun exposure was (47.1%) because in our city we have sunnier days in the year, followed by pregnancy in (31.4%) of the cases in our study. Handel et al [11] mentioned the three most-cited risk factors to be sun exposure in (27-51%), pregnancy in (26-51%) and OCP in (16-26%) of the cases in their review. Twenty nine patients had normal levels of TSH, the remaining (22) had high levels of TSH (43.1 %). These results are

close to Kiani et al[12] and Talaee et al [13] studies in which were (37.8%) and (31.5%), respectively. Majority of our cases were of dermal type, among these 22 cases were having high TSH levels, this indicate that most of dermal types of our melasma cases (20) out of (26) had thyroid stimulating hormone abnormality and their p-value was significant (<0.001). This was comparable to Aboobacker[5] study in which p-value was (0.034).

Conclusion

What we have reached in our study is that; serum TSH levels were high in near half of our study sample. Among those who had high levels of TSH, dermal type was the predominant type.

Conflicts of interest

There were no conflicts of interest.

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