

# Association of Melasma with Thyroid Autoimmunity: A Case-Control Study

Ameneh Yazdanfar, MD  
Banafsheh Hashemi, MD

Department of Dermatology, Hamedan  
University of Medical Sciences, Hamedan,  
Iran.

Corresponding Author:  
Ameneh yazdanfar, MD  
Department of Dermatology, Hamedan  
University of Medical Sciences, Hamedan,  
Iran.  
email: amyazdanfar2000@yahoo.com

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## Abstract

**Introduction:** Melasma is a common acquired hypermelanosis seen mainly in women which occurs on the sun-exposed skin of the face. The exact cause of melasma is unknown. The majority of the cases are attributed to pregnancy, combined oral contraceptive pills, genetic factors, sun exposure, use of cosmetic products, thyroid disorders and anti-convulsant drugs. This study was performed to evaluate the relationship between thyroid autoimmunity and melasma.

**Methods:** In this case-control study, 45 females with melasma who were 20-50 years old and were referred to our clinic and 45 age-matched healthy females with no history of melasma as the control group were evaluated. The skin and thyroid of all of them were examined carefully and their sera were collected and evaluated for thyroid function tests and anti thyroid peroxidase (anti TPO). Data was also statistically analyzed.

**Results:** Serum anti TPO level was higher than normal in %24.4 of the patients and %6.7 of the controls. The difference between two groups was statistically significant ( $P=0.019$ ). Serum  $T_3$  level was higher than normal in %75.6 of the patients and %48.9 of the controls. The difference between the two groups was also statistically significant ( $P=0.008$ ). Mean serum anti TPO,  $T_3$  and TSH were higher in the case group than the control group, but the difference was not statistically significant.

**Conclusion:** A possible relationship might be observed between thyroid autoimmunity and melasma. (*Iran J Dermatol 2010;13: 51-53*)

**Key words:** Melasma, Thyroiditis, autoimmune, thyroid function tests, Melanosis

## Introduction

Melasma (chloasma) is a common acquired hypermelanosis seen mainly in women which occurs on the sun-exposed skin of the face<sup>1</sup>. The exact cause of melasma is unknown. The majority of the cases are attributed to pregnancy, combined oral contraceptive pills, genetic factors, sun exposure, use of cosmetic products, thyroid disorders and anti-convulsant drugs<sup>2</sup>.

Melasma is the most common pigmentary change seen during pregnancy which occurs in more than 50 percent of the pregnant women<sup>3</sup>. Up to 10 percent of the cases of melasma are seen in men<sup>1</sup>.

There are three major patterns of distribution of the lesions<sup>3</sup>.

- Centofacial (63%): Forehead, nose, chin and upper lips.

- Malar (21%): nose and cheeks

- Mandibular (16%): mandibular ramus<sup>3</sup>.

The anterior chest and dorsal forearms may also be affected<sup>3</sup>.

Melasma is classically classified as epidermal, dermal and mixed according to its appearance under wood's lamp. In all of these forms, melanocytes are increased<sup>3,4</sup>.

Niepomniszcze et al, classified cutaneous features of thyroid disorders into two main groups:<sup>5</sup>

- Cutaneous diseases in relation to thyroid disorders, especially thyroid autoimmunity, including melasma, vitiligo, idiopathic hirsutism, bullous diseases and premenstrual acne.

- Cutaneous manifestations of thyroid disorders including myxedema, xanthoma, intraepidermal blisters, hypohidrosis and hyperhidrosis.

**Table 1.** Mean serum levels of hormones and anti TPO in the two groups.

Serum level of hormones	Controls (Mean $\pm$ SD)	Patients (Mean $\pm$ SD)	P value
T <sub>3</sub> (ng/ml)	1.37 $\pm$ 0.96	1.4 $\pm$ 0.23	0.834
T <sub>4</sub> ( $\mu$ g/dl)	8.88 $\pm$ 1.35	7.64 $\pm$ 1.28	0.300
TSH (miu/L)	2.29 $\pm$ 1.69	2.70 $\pm$ 1.83	0.275
Anti TPO (iu/ml)	113.59 $\pm$ 31.13	158.14 $\pm$ 69.71	0.187

Lutfi et al, evaluated 84 melasma patients and 24 non melasma individuals matched for age and sex as the control group <sup>6</sup>. They found an association between autoimmune thyroid disorders and melasma mostly in women whose melasma developed during pregnancy or after taking oral contraceptive pills. They found thyroid disorders in %58.3 of the melasma patients which was four times higher than the control group <sup>6</sup>.

Kiani et al, evaluated the relationship of melasma and thyroid disorders in a case-control study on 45 melasma patients and 45 non-melasma females as the control group <sup>7</sup>. They found that 37.8% of the melasma patients and 11.1% of the control group had thyroid disorders. They concluded that there was a significant relationship between melasma and thyroid disorders, especially hypothyroidism and thyroid autoimmunity <sup>7</sup>.

Our study was performed with the aim of evaluating the relationship between melasma and thyroid autoimmunity.

## Patients and Methods

In this case-control study, 45 females with melasma who were 20 to 50 years old referred to our clinic and 45 age-matched healthy females with no history of melasma as the control group were evaluated. Pregnant women and women who had used drugs which could affect serum level of thyroid hormones in the past 6 months were excluded from the study.

Three millilitre of their blood was drawn and their sera were collected to be examined for thyroid function tests including T<sub>3</sub>, T<sub>4</sub>, TSH and also anti thyroid peroxidase (anti TPO). All tests were done in one laboratory to avoid laboratory errors with ELISA method. Data was analyzed with t-test and chi-square using SPSS. The study protocol had ethical approval from the vice-chancellor for research of Hamedan University of Medical Sciences.

## Results

The mean age of the patients and the controls was 30.04  $\pm$  6.72 and 32.34  $\pm$  7.9 years, respectively, (P=0.144, t=1.475) which showed no significant difference indicating that the two groups were appropriately matched regarding age.

In 24.4% of the patients and 6.7% of the controls, serum anti TPO level was higher than normal (P=0.019) which was statistically significant.

Serum T<sub>3</sub> level was higher than normal in 75.6% of the patients and 48.9% of the controls (P=0.008) which was also statistically significant.

Mean serum levels of hormones and anti TPO in the two groups are shown in table 1. However, there was no significant difference in the mean level of T<sub>3</sub>, T<sub>4</sub>, TSH and anti TPO between patient and control group.

## Discussion

In this study, mean serum anti TPO was 158.14  $\pm$  69.71 in our patients which was higher than 52.08 iu/ml reported by Kiani et al. They found thyroid autoimmunity in 28.9% of the melasma patients and 8.9% of the controls suggesting a relationship between melasma and thyroid autoimmunity <sup>7</sup>. Moreover, the level of serum anti TPO was higher than normal in 24.4% of the patients and 6.7% of the controls, suggesting a possible relationship between thyroid autoimmunity and melasma.

In our study, serum T<sub>3</sub> level was higher than normal in 75.6% of the patients and 48.9% of the controls. Serum T<sub>4</sub> level was in normal range in 100% of the patients and 100% of the controls.

Kiani et al, also found that thyroid disorders were 3.4 times more prevalent in patients than controls <sup>7</sup>. In a study performed by Lutfi et al, thyroid disorders were four times more prevalent in patients than controls <sup>6</sup>.

Mean serum TSH level was 2.70  $\pm$  1.83 in our patients which was lower than the 3.05 miu/L reported by Kiani et al, but we find no significant difference between patients and control.

Other pigmentary changes were also seen in hyperthyroidism as diffuse hyperpigmentation or hyperpigmentation limited to lower extremities<sup>8-11</sup>. Niepomniszcze<sup>5</sup> and Ketterer<sup>12</sup> introduced melasma as one of the cutaneous features seen in the course of endocrinopathies. In a study performed by Alka Dogra, pigmentary disorders were found in 37.5% of the patients with hypothyroidism<sup>13</sup>.

Despite some difference in high level of T3, TSH and anti TPO, the mean level of these parameters showed no significant difference in our study and this put some doubt on the association of melasma with thyroid disorder or thyroid autoimmunity. However, we suggest further study on melasma patients with coincidental thyroid disorders be performed to evaluate the influence of the treatment of thyroid disorders on the development of melasma more definitely.

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