

To determine frequency of Anti-TPO antibodies in vitiligo patients

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Abstract

Background Vitiligo is an acquired depigmenting disorder due to destruction of melanocytes. An increased prevalence of autoimmune thyroid disease has been described in these patients.

Objective To determine frequency of Anti-TPO antibodies in vitiligo patients.

Materials and Methods A cross-sectional survey conducted at 3 different hospitals for 6months. 77 patients were enrolled. All the variables were recorded in proforma. Blood samples were collected under aseptic conditions and were sent to one laboratory for thyroid function tests and anti-TPO antibody test by ELISA.

Results In this study abnormal TFTs were seen in 7(9.1%) patients. Among these patients 2(28.6%) were diagnosed as hyperthyroid and 5(71.4%) were diagnosed as hypothyroid. Anti-TPO antibodies were positive in 11(14.3%) patients only. Frequency of Anti-TPO antibodies were significantly higher in younger patients i.e. 16-30 years (63.3%).

Conclusion Results of this study showed low frequency of Anti-TPO antibodies positivity in vitiligo patients. A significant association was seen between Anti-TPO antibodies with age and hypothyroidism. Patients with anti-TPO antibodies should be followed-up annually, because thyroid dysfunction can develop much later. Both vitiligo and thyroid disorders are fairly common in our population, and early screening and diagnosis help to reduce the morbidity associated with thyroid dysfunction.

Key words

Anti-TPO, Antibodies, Vitiligo, Hypothyroidism, hyperthyroidism.

Introduction

Vitiligo is a common, acquired disorder of melanin pigmentation.¹ It is the most prevalent pigmentation disorder with an incidence rate between 0.1-2% having multifocal etiology and

polygenic inheritance. The pathogenesis of vitiligo is not yet fully understood. The autoimmune hypothesis is the most commonly accepted.^{2,3} The average age of onset lies around the second to third decade of life.³

Vitiligo is an autoimmune disorder and associated with other autoimmune disorder like autoimmune thyroid disease, pernicious anaemia, Addison's disease and systemic lupus erythematosus. Among them association with

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thyroid disorder is significantly more as compared to other autoimmune thyroid disorders.⁴⁻⁶

Organ specific antibodies (anti-thyroid peroxidase, anti-thyroglobulin) to thyroid are found more frequently in the serum of patients with vitiligo than in the general population.⁷⁻⁹

Thyroid peroxidase is responsible for the iodination of tyrosine residues in the thyroglobulin molecule. Anti-TPO antibody is a tool for the detection of early subclinical autoimmune thyroid diseases, this being the most sensitive test for the diagnosis and follow up of this group of diseases. Hina Altaf et al. from Egypt noted that 16% of her vitiligo patients had an abnormal thyroid profile. Among them 11% were positive for anti-TPO antibodies whereas 5% of the control were positive for anti-TPO antibody.⁹

This study aims to estimate the presence of anti-TPO antibodies in vitiligo patients. This will help in early diagnosis of autoimmune thyroid disorder and will prevent complications of this group of disorder. Vitiligo frequently precedes the thyroid involvement, thus screening patients of vitiligo for anti-TPO antibodies is significant for vitiligo and vitiligo may be cutaneous manifestation of thyroid disorders. Local studies have not been done before, it will add to knowledge and scientific data.

Vitiligo has been described in both hypothyroidism and hyperthyroidism. Prevalence of vitiligo among patients with hypothyroidism is significantly higher compared with the general population.¹⁰

Increased risk of autoimmune/endocrine diseases were shown in the first and second degree relatives of vitiligo patients with positive organ specific antibodies.¹¹

Hashimoto thyroiditis and Graves' disease are the most important and prevalent autoimmune thyroid diseases associated with vitiligo.¹² Anti-TPO antibodies are the most common anti thyroid antibodies present in approximately 90% of Hashimoto thyroid disease, 75% of Graves' disease and 10-20% of nodular/thyroid carcinoma. Also 10-15% of normal individuals can have high level of anti-TPO antibody titres.^{13,14}

High serum antibodies are found in active phase of chronic autoimmune thyroiditis. Thus, an antibody titre can be used to assess disease activity in patients that have developed such antibodies.^{14,15}

The majority of anti-TPO antibodies are produced by thyroid infiltrating lymphocytes, with minor contributions from lymph nodes and the bone marrow.¹⁶ These antibodies cause thyroid cell damage by complement activation and antibody dependent cell cytotoxicity.¹⁴ However, anti-TPO antibodies are not believed to contribute to the destruction of the thyroid.¹⁷

The identification of the thyroid peroxidase (TPO) as the main antigen of the thyroid microsomal fraction has enabled the development of a sensitive and specific assay for detection of the corresponding autoantibodies. In a study carried out in 1994, Engler et al. evaluated the diagnostic validity of the anti-TPO assay in 303 patients with different types of thyroid disease and in controls. Clearly elevated anti-TPO values (anti-TPO > 500 units/ml) were found in 59% of patients with thyroiditis but in none of the controls or the patients with non-thyroidal illness.

Objective

To determine the frequency of anti-TPO antibodies in vitiligo patients.

Materials and Methods

It was a cross sectional survey, done in the Departments of Dermatology, Gujranwala Medical College, Lahore General Hospital, Mayo Hospital, and Department of Medicine, Lahore General Hospital. Patients aged between 16-60years of age of both sexes suffering from vitiligo were enrolled in the study. Known cases of thyroid disorders or patients using anti thyroid medication or undergone thyroid surgery were excluded from the study.

Data Collection Procedure

77 patients fulfilled the inclusion criterion were enrolled from outpatient department of all three hospitals. All the variables including demographic history name, age, and address were recorded in a predesigned proforma. Informed consent was taken. Blood samples were collected under aseptic conditions and were sent to one laboratory for thyroid function tests and anti-TPO antibody test by Elisa.

Data Analysis Procedure

The data were entered in SPSS version 16 computer program. Quantitative variable like age was presented as mean + standard deviation. Qualitative variable like thyroid status, anti-TPO positivity, skin type and site of distribution and sex were presented as frequency and percentage.

Data were stratified for age, gender, skin type, site of distribution and abnormal thyroid function tests to address effect modifiers. Chi-square test was used post stratification with P-value ≤ 0.05 considered as significant.

Results

Mean age of patients was 37.66±13.70 years. Minimum and maximum age of patients was 16

and 60 years respectively. Among study population 42(54.5%) patients were male and 35(45.5%) patients were females. Skin type distribution of patients is as follows: Type-I=0, Type-II=0, Type-III=10(13%), Type-IV=35(45.5%), Type-V=32(41.6%) & Type-VI=0. In 19.5% cases face & neck was involved, back of trunk in 6.5%, front of trunk in 13%, genitals in 3.9%, upper limb in 15.6%, lower limb in 19.5%, palms & soles in 5.2%, generalized in 16.9%. TFT's results were normal among 70(90.9%) patients and abnormal among 7(9.1%) patients. 2(28.6%) patients were hyperthyroid and 5(71.4%) patients were hypothyroid.

Anti-TPO antibodies were present in 11(14.3%) patients. Highest frequency of Anti-TPO antibodies was seen in younger age group i.e. 16-30 years: 7(63.3%), 31-45 years: 1(9.1%) and 46-60 years: 3(27.3%), p-value=0.135.

Table 1 Anti-TPO antibodies in relation to skin type of patients

Skin Type	Anti-TPO		Total
	Present	Absent	
I	0	0	0
II	0	0	0
III	0	10(15.2%)	10(13%)
IV	7(63.6%)	28(42.4%)	35(45.5%)
V	4(36.4%)	28(42.4%)	32(41.6%)
VI	0	0	0
Total	10	67	77

Chi-Square Test= 2.683, p-value= 0.261

Table2 Anti-TPO antibodies in relation to site of distribution

	Anti-TPO		Total
	Present	Absent	
Scalp	0	0	0
Face & neck	3(27.3%)	12(18.2%)	15(19.5%)
Trunk (back)	0	5(7.6%)	5(6.5%)
Trunk (front)	1(9.1%)	9(13.6%)	10(13%)
Genitals	1(9.1%)	2(3%)	3(3.9%)
Upper limbs	0	12(18.2%)	12(15.6%)
Lower limbs	2(18.2%)	13(19.7%)	15(19.5%)
Palms & soles	0	4 (6.1%)	4(5.2%)
Mucous membrane	0	0	0
Generalized	4(36.4%)	9(13.6%)	13(16.9%)
Total	11	66	77

Table 3 Anti-TPO antibodies in relation to abnormal TFT's

Skin Type	Anti-TPO		Total
	Present	Absent	
I	0	0	0
II	0	0	0
III	0	10(15.2%)	10(13%)
IV	7(63.6%)	28(42.4%)	35(45.5%)
V	4(36.4%)	28(42.4%)	32(41.6%)
VI	0	0	0
Total	10	67	77

No statistically significant association was seen between site of distribution of vitiligo on body and Anti-TPO antibodies i.e. p -value = 0.347.3 (Table 2). Patients who were diagnosed with hypothyroidism, among them frequency of Anti-TPO antibodies was insignificantly differ as that of patients with hyperthyroidism i.e. p -value=0.495 (Table 3).

Discussion

In this study frequency of anti-TPO antibodies is 14% in vitiligo patients. Daneshpazhooh et al. reported 18.1% anti-TPO positivity in 94 cases of vitiligo compared with 7.3% in control group.¹⁸

Similarly Altaf et al. reported 11% anti-TPO positivity in 192 cases of vitiligo compared with 2.6% in control group.⁹ Sedighe and Gholamhossein also assessed and detected the high frequency of anti-thyroid antibodies in Iranian patients with vitiligo.¹⁹ Recently in 2017 Jishna P reported Anti-TOP antibodies positivity as 36% in Vitiligo patients.²⁰ Another study from India reported anti-TPO antibody positivity (thyroid autoimmunity) in 28% patients of vitiligo.²¹

In this study frequency of Anti-TPO antibodies positivity in vitiligo patients was lower when compared to above mentioned studies. Only Altaf et al. reported lower frequency of 11% which is lower. This difference can be due to difference in sample size and other

methodological considerations.

In this study abnormal thyroid function tests were seen in only 7(9.1%) patients, 2(28.6%) were hyperthyroid and 5(71.4%) were hypothyroid. Altaf et al. showed that 31 (16.1%) patients had abnormal TFTS⁹, which is much higher as compared to this study. However, in both studies the frequency of hypothyroidism is greater than hyperthyroidism. The difference may be due to high prevalence of thyroid disorder in other population or low frequency of thyroid disorder in our community. This finding is consistent with other studies who reported higher frequency of hypothyroidism among anti TPO positive patients.^{20,22,23} Higher prevalence of hypothyroidism in our study can be due to delay in seeking medical advice and thyroid evaluation in our population.

In this study, younger patients (age group 16-30 years) had the highest frequency of Anti-TPO positivity. However, in the older age groups frequency of Anti-TPO antibodies was low.

Jishna P results are in accordance with the findings of this study regarding age distribution for Anti-TPO antibodies positivity. As in his study in the vitiligo group with anti-TPO antibody positivity, 30 (83.3%) patients were above the age of 12 years and 6 (16.7%) were at or below the age of 12 years.²⁰

Dash in his study reported that participants in the anti-TPO antibodies positive group were mostly in their third decade and beyond while those found negative were mostly in the second decade of life and their representation consistently decreased in the subsequent decadal age bands.²¹

In this study frequency of Anti-TPO antibodies was higher in male patients (63.6%) as compared to females (36.4%). This finding is

not in accordance to the findings reported by Altaf et al, Nunes and Dash. Altaf et al. and Nunes observed a significantly higher incidence of thyroid dysfunction as well as anti-TPO antibodies positivity in females in their respective studies.^{9,22} Dash in his study showed that the proportion of females in the anti-TPO Ab positive group was higher (71.4%) than in the anti-TPO Ab negative group (54.2%), with the female: male ratio in the two groups being 5:2 and 5:4, respectively. However, sex predilection for females in either group was not statistically significant (p-value=0.115).²¹

A possible explanation of this difference can be explained by the fact that in this study male patients were greater in number. However among women estrogen may play a possible role in the pathogenesis of autoimmune thyroid disorders, and other autoimmune diseases like systemic lupus erythematosus and systemic sclerosis are also more common in women.

In this study the most frequent affected areas seen in patients were face and neck followed by front of trunk, genitals, upper limbs and palms and soles. Evidence suggests that the primary site of involvement in vitiligo is sun-exposed areas.^{22,24} A study from Kuwait noted that majority of their patients reported depigmentation in lower limbs followed by upper limbs, head and neck, trunk, and mucosae in decreasing order.²⁵

Hence, screening vitiligo patients for thyroid autoimmunity so as to diagnose and initiate treatment for any comorbidity with the anti-TPO antibodies titre seems to be relevant as this antibody is a sensitive and specific marker of autoimmune thyroid disorders. Perhaps, studies on a larger number of vitiligo patients with control group from general population who can be followed up for a considerable time would further strengthen these associations and also

identify other specific clinical parameters of vitiligo that could raise suspicion for associated thyroid autoimmunity.

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