FREQUENCY OF ANTI THYROID PEROXIDASE ANTIBODY IN PATIENTS OF VITILIGO

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ABSTRACT

Objective: The objective of this study was to compare the frequency of anti thyroid peroxidase antibody in patients suffering from vitiligo with healthy control group.

Type of Study: Case control study.

Settings: Dermatology Department, Military Hospital, Rawalpindi, from 20th March 2010 to 20th July 2011.

Material and Methods: Fifty clinically diagnosed patients of vitiligo, age ≥ 18 yrs and both genders with no history of thyroid disease, past or current use of drugs for thyroid disorder or thyroid surgery were included as cases (Group A). Fifty healthy individuals with no evidence of vitiligo or thyroid disorder on history and physical examination and with no family history of vitiligo, matched for age and gender with cases, were included as control (Group B). Serum anti thyroid peroxidase (anti TPO) antibodies were measured using enzyme linked immunosorbent assay (ELISA) in both cases and control.

Results: Eight (16%) patients in Group A were anti-thyroid peroxidase antibody positive and forty two (84%) patients were negative while one (2%) patient was anti-thyroid peroxidase antibody positive in Group B and forty nine (98%) patients were negative (p = 0.001).

Conclusion: Anti TPO antibody is significantly more common in patients of vitiligo as compared to general population.

Keywords: Vitiligo, thyroid disorder, anti thyroid peroxidase antibodies.

INTRODUCTION

Vitiligo is a disorder of pigmentation characterized by a selective destruction of melanocytes that affects approximately 0.1–2% of the population. An autoimmune etiology is generally accepted and possible genetic factors seem to play an important role in the pathogenesis of this disease. Autoimmune etiology is based mainly on the association of vitiligo with known autoimmune diseases and the presence of organ specific antibodies in affected patients.

As many as 30% of all vitiligo cases have some form of thyroid disease such as Hashimoto's thyroiditis or Grave's disease. It is well known that there is an increased prevalence of diabetes mellitus, pernicious anemia, and uveitis in individuals with vitiligo[5]. Vitiligo precedes the development of autoimmune thyroid disorders by less than a year to several years.

The anti thyroid peroxidase (anti-TPO) autoantibody assay is most sensitive for detecting Hashimoto's thyroditis and idiopathic myxedema (sensitivity = 93%) where antibody levels are typically greater than 1000 IU / ml. Patients with Graves' disease are frequently positive (sensitivity = 73%) and often have lower levels of antibodies[9]. Generally these anti TPO antibodies are not positive in normal population. However up to 10% of apparently healthy, asymptomatic adults may test positive for low levels of anti-TPO[1]. The incidence of these antibodies is 5 times more frequent in women than in men and increases with age reaching 30% in elderly[1]. These auto antibodies were found to be positive in 31.4% of cases of vitiligo as against 10% of controls in a study carried out on Indian patients[2].

This study was designed to assess the frequency of anti-TPO antibodies, which is a

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sensitive marker of autoimmune thyroid disease, in vitiligo patients and compare it with healthy subjects.

MATERIAL AND METHODS

This is a case control study, conducted at Dermatology outpatient department, Military Hospital, Rawalpindi from March 2010 to July 2011. Fifty patients of either gender, with clinically diagnosed vitiligo, age ≥ 18 years, were included in Group A using non probability purposive sampling, after informed written consent and permission from Hospital Ethical Committee. This study group had no history of thyroid disease or history of or current use of drugs for thyroid disorder or past history of thyroid surgery.

A detailed history and physical examination was recorded on a specially prepared performa in all 50 cases. History included age of onset, duration and family history of vitiligo. Physical examination included the distribution pattern of vitiligo patches and extent of disease in terms of percentage of body surface area involved. Diagnosis of vitiligo was reconfirmed by examination under Woods lamp. Vitiligo was classified according to pattern of its distribution into generalized, focal, acrofacial (lip-tip), mucosal, segmental, universalis and unclassified.

Fifty healthy individuals including medical staff, residents, medical students and family members of patients with skin diseases other than vitiligo, with negative family history of vitiligo, matched for age and gender with group A, were enrolled as a control group B. A detailed history including personal and family history of vitiligo and thyroid diseases was taken followed by physical examination including that of thyroid and was recorded.

Blood sample of both group A and group B was collected under aseptic measures for measurement of serum anti TPO antibodies. Serum anti TPO level was assessed at Armed Forces Institute of Pathology using enzyme linked immunosorbent assay ELISA (using kit by Serion) (reference range: ≤ 10 IU/ml).

The data was analyzed using SPSS version 16. Descriptive statistics were used to describe the results. Difference in anti TPO detection between study and control groups was tested by Chi-square test and $p<0.05$ was considered significant.

RESULTS

There were 50 patients of vitiligo in Group A and a similar number of controls in Group B. The demographic characteristics of subjects in these two groups are shown in Table 1. The clinical characteristics of vitiligo in Group A patients are shown in Table 2. In Group A the anti-thyroid peroxidase antibody test was positive in eight (16%) patients and negative in forty two (84%) patients whereas in Group B, the test was positive in one (2%) patient and negative in forty nine (98%) patients. Frequency of anti TPO was significantly higher in cases with OR= 9.333, CI = 2.086-41.770 and p=0.001.

DISCUSSION

Vitiligo is considered to have an autoimmune etiopathogenesis, supported by the detection of certain organ specific auto antibodies in the sera of vitiligo patients of which the most prevalent are the ant thyroid peroxidase antibodies.

Thyroid peroxidase is an enzyme expressed mainly in the thyroid that liberates iodine for addition onto tyrosine residues on thyroglobulin for the production of thyroxin (T_4) or triiodothyronine (T_3), thyroid hormones. Anti-thyroid peroxidase antibodies are most commonly associated with Hashimoto's thyroiditis and their presence in the serum is an established sensitive tool for the detection of early subclinical autoimmune thyroid disease and identification of at-risk population for autoimmune thyroid dysfunction[5]. In a study of Kashmiri population, among the 21 patients positive for anti-TPO antibodies, 18 (86%) patients had hypothyroidism. It has been suggested in this study that if anti-TPO antibodies are present with a normal thyroid function, thyroid ultrasonography should be performed to detect changes that are compatible

with autoimmune thyroiditis. This will help in detecting subclinical autoimmune disease, so that to be positive for anti TPO antibodies compared with only 2% of the controls. The results are

Table 1: Demographic characteristics of study subjects.

	Vitiligo Group (Group A)	Control Group (Group B)
Males n (%)	22 (44%)	22 (44%)
Females n (%)	28 (56%)	28 (56%)
Age (years) Range (mean ± SD)	18 – 60 (30.84 ±8.97)	19 – 62 (31.22 ±9.031)

Table 2: Clinical characteristics of patients with vitiligo

Types of vitiligo n (%)	
Generalized	35 (70%)
Focal	9 (18%)
Acrofacial	3 (6%)
Segmental	1 (2%)
Universalis	1 (2%)
Extent of Disease (%)	
Range (mean ± SD)	1 – 84 (18.64 ±15.886)
Cases with <20% skin surface involved n (%)	35 (70%)
Cases with 20 - 50% skin surface involved n (%)	13 (26%)
Cases with >50% skin surface involved n (%)	2 (4%)
Age in years at onset of vitiligo	
Range (mean ± SD)	6 – 49 (21.36 ±8.149)
Duration of vitiligo in years	
Range (mean ± SD)	1 – 29 (9.58 ±7.186)
Family history of vitiligo n (%)	6 (12%)

monitoring and possible hormone replacement can be done.

Nordyke et al reported that anti-TPO antibody tends to have more correlation with thyroid dysfunction than does any other anti thyroid antibodies. Vitiligo frequently precedes the development of thyroid disease including Grave's disease and Hashimoto thyroiditis, thus screening vitiligo patients for thyroid antibody seems plausible. It has also been proposed by Kakourou T et al that patients with vitiligo should be annually screened for thyroid function (with serum TSH, anti-TPO antibody and anti-thyroglobulin antibody).

Our study comparing the frequency of anti TPO antibodies in vitiligo patients with the healthy controls has shown 16% of vitiligo cases comparable with other published loco regional and international studies. Daneshpazhooh and colleagues[1] in their study observed 18% of vitiligo patients to be positive for anti-TPO antibodies, a remarkable similarity to our results. In the study by Sedighe and Gholamhossein[7], anti TPO antibody was positive in 36.7% of the patients. The observed frequency of anti TPO antibodies was higher in their study compared to ours but this difference could be because their study had more female cases and 30.1% of their cases had goitre while it was an exclusion criterion in our study. Study of vitiligo in adults from Estonia, which evaluated association of vitiligo with many different auto antibodies, found anti-TPO antibodies to be positive in 36.9% of the patients. Twenty eight patients out of one forty four in this study had overt thyroid disease and thirty one

relatives of the study patients had thyroid disease possibly explaining for the difference in frequency of positivity of anti-TPO antibodies compared to our study as none of the cases in our study had evidence of thyroid disease (an exclusion criterion in our study).

Other studies have also shown similar association, with anti TPO antibody being positive in 31.4% of cases in a study from India[3], in 34% of patients in a study of 40 patients from United Kingdom and in 21% of patients in a report of 106 patients from Australia. In a study carried out in Greece in 54 cases of vitiligo, prevalence of anti TPO antibody was 24.1%[18]. Study from Cedars-Sinai Medical Center, Los Angeles, California, USA found anti thyroid peroxidase antibodies to be positive in 37% of vitiligo patients.

The clinical implication of this study is that anti TPO antibodies, which are significantly higher in vitiligo patients even in the absence of any clinical evidence of thyroid disease, can act as a tool for earlier detection of thyroid disease in the follow up of such patients. Based on this study, we recommend that physicians and dermatologists should advise anti TPO antibodies in the follow up and management plan of vitiligo patients.

CONCLUSION

Anti TPO antibodies are more frequently observed to be positive in patients with vitiligo compared to healthy adults.

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