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ORIGINAL RESEARCH ARTICLE

Thyroid Dysfunction And Anti-Thyroid Peroxidase Antibody In Patients With Vitiligo

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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.

The aim of this study is to compare the frequency of anti-thyroid peroxidase antibody (anti-TPO) and to assess the prevalence of thyroid dysfunction in vitiligo patients with healthy subjects.

Methods

Sera from 118 patients of vitiligo and 50 control subjects without any clinical evidence for thyroid dysfunction were assayed for thyroid profile (free T3, Free T4 and TSH) and anti-TPO antibodies.

Result

Our study concludes that about 12.7% vitiligo patients have associated hypothyroidism. Anti-TPO was detected in 21 (17.8%) of patients while none of the control was positive; the difference was significant with p value < 0.000.

Conclusion

According to our study thyroid dysfunction particularly towards hypothyroidism and anti-TPO was shown to be significantly more common in vitiligo patients compared with control group. As this antibody is sensitive and specific marker of autoimmune thyroid disorders, we recommend thyroid function evaluation and thyroid antibodies detection in these patients.

Keywords- vitiligo, hypothyroidism, hyperthyroidism, TSH, anti TPO antibody

INTRODUCTION

Vitiligo is one of the most common skin disorders with a prevalence of 1-2% in different populations. It is an acquired depigmenting disorder due to destruction of melanocytes. Although many theories have been suggested for its pathogenesis, but the most popular one is the role of autoimmunity. Numerous studies have been conducted which shows the significant increase in frequency of various autoimmune disorders including autoimmune thyroid disease, pernicious anaemia, addison's disease and systemic lupus erythematosus in vitiligo patients [1,2]. The frequency of various thyroid antibodies such as Thyroid stimulating antibody, anti-thyroglobulin antibody and anti-thyroid peroxidase (TPO) has been detected at increased level in vitiligo patients[3,4]. Screening of vitiligo patients for thyroid function and thyroid antibody seems plausible since vitiligo frequently precedes the thyroid involvement[5]. The incidence of thyroid disease in vitiligo is reported to vary from 0.62-12.5% approaching 39% in elderly patients, thus the association of thyroid disease and vitiligo assumes significance [6]. Vitiligo is associated with both Hashimoto and grave's disease which are the most important and prevalent autoimmune thyroid diseases.

Anti TPO are detected in more than 90% cases of Hashimoto thyroiditis and about 75% of Graves' disease [4,7]. Keeping this in view we have assayed sera from 118 clinically euthyroid cases of vitiligo and 50 healthy subjects for serum T3 (triiodothyronine), T4 (Thyroxine), TSH (Thyrotropin) and anti-TPO antibody to see whether this is altered in vitiligo.

MATERIALS AND METHODS

Subjects: A total of 118 patients of vitiligo were taken from the outpatient department of

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Dermatology and Venereology of Sir Sunderlal hospital, B.H.U., Varanasi during a period of 1 year.Vitiligo patients included 77 cases (65.25%) of generalized vitiligo and 41 Cases (34.74%) of localized vitiligo. 50 healthy controls from staffs and student of the institute were included in the study with no present and past history of autoimmune or any systemic disease. Clinical diagnosis of the patients was done by the dermatologist. Blood samples were taken when the patients first visited the dermatologist. The study was approved by the ethical committee of this institute and the consent was given by all the patients enrolled in the study.

Laboratory analysis: Anti thyroid peroxidase antibody (anti-TPO) was done by gelatin agglutination method, kit of Serodia, Japan. The titre of anti-TPO 1:100 or above was taken as positive.Thyroid function tests (T3, T4, TSH) were done by indirect enzyme linked immunosorbent assay (ELISA), kit of Biotron, france, supplied by M/S OSB Agencies Delhi, India. The following values were taken as normal:

TSH- 0.39-6.16µIU/ml

T3- 0.6-1.85 ng/ml

T4- 4.8-14 µg/dl

Statistical analysis: The statistical analysis of the data was done using student's t test for difference of means and chi square test on SPSS for windows (version 16.0) statistical package (SPSS Inc., Chicago, IL) computer statistics program. P values less than 0.05 was taken as significant.

RESULTS: Some of the demographic and clinical findings of vitiligo patients are presented in (**Table1)**. The mean ages were 33.02 ± 16.55 year old and 30.21 ± 8.02 year old in the case and control group respectively. None of the patients had diagnosis of thyroid disease earlier. Thyroid abnormalities was detected after test.T3 level was reduced in 14.4% and increased in 5.9% patients of vitiligo while in controls only 6% had low T3 and another 6 % had high T3 level. Mean value was not statistically significant when compared to control **(Table 2).**

Serum T4 was reduced in 9.3% and increased in 4.2% patients of vitiligo while in controls only 4% patients had high T4 value. Mean value of T4 (8.91±3.31µg/dl) was significantly reduced in vitiligo (p< 0.000) as compared to controls (12.86±1.07µg/dl) **(Table 3)**. TSH level was increased in the 12.7% of vitiligo patients than the 4% of control group; 3.56±1.62 versus 2.84±1.57 µIU/ml respectively and 87.5% of vitiligo patients versus 96% of control group was in normal range. There was a significant difference between the means of two groups [(p=0.034) **(Table 4)**]. (TSH normal range: 0.39-6.16µIU/ml).

Anti-TPO was detected in 21 cases (17.8%) in vitiligo patients as compared to controls (**Table 5)**. The difference is statistically significant with a p value of 0.014. Sexwise 8(11.1%) of males and 13 (28.3%) of females were anti-TPO positive (**Table 6)**. There was a significant difference in anti-TPO positivity in female cases as compared with male cases (p<0.034).

Table 1: Clinical characteristics of vitiligo patients

Mean age +/- SD (year)	33.02±16.55
Age range	8-74
Gender (female :male)	46:72
Age(year)	
<17	19(16.1)
18-25	32(27.1)
26-35	24(20.3)
>36	43(36.4)
Mean age of onset +/- SD(year)	26.496±14.80
Age of onset range (year)	8-74
Mean duration +/- SD (year)	6.60±6.30
Duration Range (year)	0-40
Extent(year)	
<15	109(92.4)
15-40	9(7.6)
>40	0(0)
Types of vitiligo, n(%)	
Vulgaris	32(27.1)
Focal	37(31.4)
Acrofacial	35(29.7)
Segmental	4(3.4)
Universalis	10(8.5)

Table 2 Correlation of T3 among cases and control

Groups	<0.6 ng/ml		0.6-1.85 ng/ml		>1.85ng/ml		Mean±SD	P value
	No	%	No	%	No	%		
Vitiligo(118)	17	14.4	94	79.7	7	5.9	1.12±0.51	P=0.298
Control(50)	3	6	44	88	3	6	1.01±0.56	NS

NS – Non significant

Table 3 Correlation of T4 among cases and control

Groups	<4.8µg/dl		4.8-14 µg/dl		>14 µg/dl		Mean±SD	P value
	No	%	No	%	No	%		
Vitiligo(118)	11	9.3	102	86.4	5	4.2	8.91±3.31	P=0.000*
Control(50)	0	0	48	96	2	4	12.86±1.07	

*P< 0.05, Significant

Table 4. Correlation of TSH among cases and control

Groups	<0.39uIU/ml		0.39-6.16uIU/ml		>6.16uIU/ml		Mean ±SD	P value
	No	%	No	%	No	%		
Vitiligo(118)	0	0	103	87.3	15	12.7	3.56±1.62	P=0.034*
Control(50)	0	0	48	96	2	4	2.84±1.57	

*P< 0.05, Significant

Table 5. Correlation of Anti-TPO antibody among cases and controls

Group	**Anti-TPO antibody**		**Total**
	Negative	**Positive**	
Vitiligo	97	21	118
	88.2	17.8	100.00%
Controls	50	0	50
	100	0	100.00%
Total	147	21	118
	82.2	17.8	100.00%
$\chi 2$ = 6.021		P value=0.014*	

Table 6. Correlation of Anti-TPO antibody with gender in vitiligo patients

Group	**Anti-TPO antibody**		**Total**
	Negative	**Positive**	
Males	64	8	72
	88.9	11.1	100.00%
Females	33	13	46
	71.7	28.3	100.00%
Total	97	21	118
	82.2	17.8	100.00%
$\chi 2$ = 5.643		P value=0.018*	

*P< 0.05, Significant

DISCUSSION

Vitiligo is a common skin disorder in which skin depigmentation is due to destruction of melanocytes. Although the exact etiology and pathogenesis of this disease is not clear, autoimmune melanocytic destruction has been advocated [8]. Increased prevalence of autoimmune disorders in association with vitiligo, detection of various autoantibodies including anti-thyroid and anti-melanocyte antibodies in the serum of vitiligo patients and alteration of T-cell population showing decreased T-helper cells are in favour of this role [9]. Our study was planned to evaluate the thyroid function test and to detect the presence of anti-TPO in patients with vitiligo in our population.

According to our study the rate of anti-TPO positivity was found to be 17.7% and statistically significant in vitiligo patients compared with control. These results can be substantiated by other studies. In a study that was performed on 35 patients with vitiligo in India, 40% had thyroid dysfunction and 34% were anti-TPO and anti-thyroglobulin antibody positive [10]. In another study conducted by Mandry et al. on 20 patients with vitiligo, they detected anti microsomal and anti-thyroglobulin antibodies in 50% and 40% of their cases [11]. Similarly Morgan et al also found higher prevalence of thyroid antibodies in

generalized vitiligo patients as compared with controls [12]. Lacovelli et al showed thyroid dysfunction in 7% children with non-segmental vitiligo [13]. In another study by Kurtev and Dourmishev on children and adolescents with vitiligo reported anti-microsomal antibodies in 50% of their cases [3]. Daneshpazhooh et al also reported 18.1% anti-TPO positivity in 94 cases of vitiligo compared with 7.3% in control group [14]. Similarly Altaf et al showed 11% anti-TPO positivity in 192 cases of vitiligo compared with 2.6% in control group [15]. Sedighe and Gholamhossein also assessed and detected the high frequency of anti-thyroid antibodies in Iranian patients with vitiligo [16].

According to our study, the difference in the prevalence of anti-TPO was significant in female cases compared with males. This is in concordance with the results obtained in the study of Daneshpazhooh et al. and Altaf et al. Both found that the frequency of anti-TPO remained significant in females [14,15]. The reported higher prevalence of thyroid abnormalities in women than in men with vitiligo in the earlier published review could be substantiated by this study [17].

According to our study 29.66% patients with vitiligo had an abnormal thyroid profile. There was a significant difference between the means of FT4 and TSH between patients and control group. Serum level of FT4 and TSH was lower and higher respectively in vitiligo patients as compared with controls. Thus vitiligo cases are shown to be more at risk of evolution toward subclinical thyroid disease particularly, hypothyroidism. This is in concordance with study of Lacovelli *et al* [13]. Sedighe and gholamhossein also found 15.7% of hypothyroidism in vitiligo patients [16]. Contrary to this Daneshpazhooh et al. and Altaf et al found no significant thyroid dysfunction in vitiligo patients [14,15]. Further studies with larger sample size are suggested to elucidate these issues in future.

CONCLUSION

Our study concludes that about 12.7% vitiligo patients have associated hypothyroidism. Anti-TPO was shown to be significantly more common in vitiligo patients compared with control group. As this antibody is sensitive and specific marker of autoimmune thyroid disorders, we recommend thyroid function evaluation and thyroid antibodies detection in these patients especially in female patients.

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