Original Research Article

Study of relationship between thyroid dysfunction and vitiligo

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Abstract

Background: Vitiligo is a common idiopathic, heritable depigmentary disorder of the skin and or mucous membranes. There is higher a incidence of vitiligo patients shown association with systemic diseases, particularly autoimmune disorders including pernicious anemia, Addison's disease, Grave's disease, hyperthyroidism, hypothyroidism, thyroiditis, hyperparathyroidism, diabetes mellitus and altered lipid profile. Present study was undertaken to assess the correlation between vitiligo and thyroid dysfunction. **Material and Methods:** Present study was a cross sectional, descriptive study of 104 cases and 30 controls in patients >15years presenting with vitiligo attending outpatient department of Dermatology. **Results:** There were total of 31 cases (29.8%) in the age group of 15- 25 years and only four cases (3.8%) found above 65 years. In the present study, 54 (51.9%) were males and 50 (48.1%) females (M:F-1.08:1) and sex matched controls. 32 cases (30.8%) showed duration less than 6 months, and majority (40%) had disease duration between 1-5 years. The positive family history was found in only 10.6% cases, majority in the first degree relatives. Preexisting diabetes mellitus, thyroid dysfunction was seen in 4.8% and 6.7% of the cases respectively. Cases showed higher number of thyroid dysfunction compared to controls. Total 31 cases (29.8%) showed altered thyroid hormone levels and 3 (10%) controls ($P<0.05$). 26 cases (25%) were hypothyroid, 5(4.8%) hyperthyroid and 73 cases (70.19%) were euthyroid. T3 and T4 levels were altered more in young and middle aged groups and TSH in all age groups. TFT changes were more in females. Elevated levels of T3 were noted in cases with 1-5 years of disease duration while T4 and TSH in less than 6 months. **Conclusion:** Present study revealed a significant association between vitiligo and thyroid dysfunction. Middle aged patients and those with early onset of the disease were more commonly affected.

Keywords: autoimmune disorders, thyroid dysfunction, vitiligo, hypothyroid

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INTRODUCTION

Vitiligo is a common idiopathic, heritable depigmentary disorder of the skin and or mucous membranes.[1] It is a major social and cosmetic concern in India, characterised by depigmented macules of varying sizes and shapes. There are no other textural changes besides loss of skin color.[2] Vitiligo occurs worldwide with an overall prevalence of 1%.[3] Some dermatologic outpatient records show the incidence of vitiligo to be 3-4 % in India, although an incidence as high as 8.8 % has also been reported.[3] In Indian states of Gujarat and Rajasthan, the prevalence of vitiligo is very high being described by some as of epidemic importance.[4] There is higher a incidence of vitiligo patients shown association with systemic diseases, particularly autoimmune disorders including pernicious anemia, Addison's disease, Grave's disease, hyperthyroidism, hypothyroidism, thyroiditis, hyperparathyroidism, diabetes mellitus[3,5,6] and altered lipid profile.[7] Present study was undertaken to assess the correlation between vitiligo and thyroid dysfunction.

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MATERIAL AND METHODS

Present study was a cross sectional, descriptive study of 104 cases and 30 controls. Present study was undertaken from November 2011 to May 2013 in the dermatology department, JSS Medical College, Mysore. Institutional ethical committee approval was taken for present study.

Inclusion criteria:

- Patients, >15years presenting with vitiligo attending outpatient department of Dermatology

Exclusion criteria:

- Children less than 15 years with vitiligo
- Pregnant women
- Those on lipid lowering agents

A detailed history and thorough clinical examination was carried out and subsequently blood samples were collected and analysis of thyroid function tests were done in all the cases. Total of 30 age and sex matched controls were also subjected for the similar tests. Those controls with associated thyroid dysfunction, diabetes mellitus, hyperlipidemia and hypertension were excluded from the study. All the statistical calculations were done through SPSS for windows (V 16.0). Crosstabs (Contingency table analysis) and Chi-square test were used for statistical analysis. P value less than 0.5 was considered significant.

RESULTS

Total 104 cases and age matched controls were included. The age of the patients ranged from 15-75 years, with mean age of 36.9 years. There were total of 31 cases (29.8%) in the age group of 15- 25 years and only four cases (3.8%) found above 65 years. In the present study, 54 (51.9%) were males and 50 (48.1%) females (M:F-1.08:1) and sex matched controls. Males were more commonly affected. The majority of affected males (27.8%) were in the age group of 46-55 years and females (44.2%) were in 15-25 years.

Table 1: Age distribution

Age (years)	No of cases (n=104)	%	No of controls (n=30)	%
15-25	31	29.8	4	13.3
26-35	21	20.2	5	16.7
36-45	17	16.3	6	20
46-55	21	20.2	5	16.7
55-65	10	9.6	6	20
65-75	4	3.8	4	13.3
Gender				
Male	54	51.9	15	50
Female	50	48.1	15	50

32 cases (30.8%) showed duration less than 6 months, 12 cases (11.5%) between 6 months to 1 year and majority (40%) had disease duration between 1-5 years, 18 cases (17.3%) more than 5 years duration. Thus 82.6% of cases were less than 5 years.

Table 2: Duration of the cases

Duration	No of cases	%
< 6 months	32	30.8
6 m -1 year	12	11.5
1-5 years	42	40.4
>5 years	18	17.3
3Total	**104**	**100%**

The positive family history was found in only 10.6% cases, majority in the first degree relatives. Preexisting diabetes mellitus, thyroid dysfunction was seen in 4.8% and 6.7% of the cases respectively.

Table 3: Family history and associated diseases

Associated diseases	No of cases	%
Positive Family history	11	10.6
Hypertension (recent)	6	5.8
Diabetes	5	4.8
Hypertension	10	9.6
Thyroid dysfunction	7	6.7
Dermatological diseases	4	3.8

Most of the cases (43.3%) presented with vitiligo vulgaris, followed by acrofacial (25%) and focal type of vitiligo (24%). The maximum body surface area was 40% in one case which was vulgaris type and remaining cases were less than 15%.

Table 4: Morphological types

Type of vitiligo	No. of cases	%
Vitiligo vulgaris	46	44.23
Acrofacial type	26	25
Focal	24	23.07
Mucosal	8	7.69
Total	**104**	**100%**

Cases showed higher number of thyroid dysfunction compared to controls.

Table 5: Comparison of TFT in cases and controls

TFT	No of cases	%	No of controls	%	P value
T3	6	5.8	1	3.3	0.597
T4	9	8.7	1	3.3	0.329
TSH	21	20.2	2	6.7	0.083

Total 31 cases (29.8%) showed altered thyroid hormone levels and 3 (10%) controls (P<0.05). 26 cases (25%) were hypothyroid, 5(4.8%) hyperthyroid and 73 cases (70.19%) were euthyroid.

Table 6: Overall assessment of thyroid function tests in cases and controls

TFT	Cases	Controls
Normal	73 (70.2%)	27 (90%)
Abnormal	31 (29.8%)	3 (10%)
Total	**104 (100%)**	**30 (100%)**

P - 0.028.

T3 and T4 levels were altered more in young and middle aged groups and TSH in all age groups. P value for the above findings >0.05.

Table 7: Analysis of TFT in relation to the age distribution.

Age in years	T3 No of cases (%)	T4 No of cases (%)	TSH No of cases (%)
15-25	2 (6.5)	4 (12.9)	2 (6.5)
26-35	2 (9.5)	1 (4.8)	5 (23.8)
36-45	1 (5.9)	2 (11.8)	4 (23.5)
46-55	0	2 (9.5)	5 (23.8)
55-65	1 (10)	0	3 (30)
65-75	0	0	2 (50)
Total	**6 (5.8%)**	**9 (8.7 %)**	**21 (20.2%)**
P value	0.787	0.751	0.229

TFT changes were more in females. P value for the above findings >0.05.

Table 8: Analysis of TFT in relation to gender distribution

Gender	T3 No of cases (%)	T4 No of cases (%)	TSH No of cases (%)
Male	2 (3.7)	3 (5.6)	7 (13)
Female	4 (8)	6 (12)	14 (28)
Total	**6 (5.8%)**	**9 (8.7 %)**	**21 (20.2 %)**
P value	0.348	0.243	0.056

Elevated levels of T3 were noted in cases with 1-5 years of disease duration while T4 and TSH in less than 6 months. P value for the above findings >0.05.

Table 9: Analysis of TFT in relation to the duration of the disease

Duration of disease	T3	T4	TSH
	No of cases (%)	No of cases (%)	No of cases (%)
< 6 months	1 (3.1)	5 (15.6)	7 (21.9)
6 months -1 year	0	1 (8.3)	1 (8.3)
1-5 years	4 (9.5)	3 (7.1)	6 (14.3)
>5 years	1 (5.6)	0	7 (38.9)
Total	**6 (5.8%)**	**9 (8.7%)**	**21 (20.2%)**
P value	0.525	0.284	0.116

DISCUSSION

Vitiligo is evidently another "skin-marker of internal disease" and has been reported in association with autoimmune and or endocrine diseases. Vitiligo offers many benefits as a model for the study of autoimmunity, in that it can be used to identify the contributing roles of immunogenetics and endocrine factors in the initiation and propagation of autoimmune disease. Out of the 104 cases, 51% males and 48% females were noted in the present study. Male preponderance was seen with M:F ratio of 1.08:1. This is similar to earlier studies.[8-10] The male preponderance could be explained by the fact that a greater number of male patients attended the OPD. The age group of patients ranged from 15-75 years, the mean age being 36 years. The maximum numbers of cases were within 15-25 years age group (29%) and only 4 cases (3.8 %) found at 65-75 years. This is similar to studies done earlier.[8,11] This could be explained by the cosmetic concern by most of young individuals in the present study. The duration of the disease ranged from 3 months to 40 years. Duration of vitiligo was less than 5 years for 86 cases (82%) and more than 5 years for 18 patients (17%). This is comparable in a study in which 70% of the cases had duration of less than 5 years and 29% had more than 5 years.[8] Only 10% cases showed presence of positive family history. These are similar to several other studies.[12-14] However various other studies showed significant positive family history. And among associated diseases 2 had halo nevus, each one had lichen planus and discoid lupus erythematosus. These were comparable to study by Gopal *et al.* where only 2 cases showed halo nevus [8] and presence of lichen planus in one case in a study by Martis J *et al.* [13] and 0.49% DLE in another study.[6] The commonest morphological pattern was vitiligo vulgaris (44%) followed by acrofacial type (25%) and mucosal type (7%). There were no cases of segmental and universal type in the present study. This is similar in a study, in which vitiligo vulgaris was the commonest, however unlike our study, their study also had segmental and universal types.[13] Few studies showed focal type being the commonest morphological pattern.[8,14] In contrast to our study, Shankar DS *et al.* showed segmental type was the second most common after generalized vitiligo.[10] In the present study, age groups less than 15 years were excluded, which explains for non-occurrence of segmental type. There were 5 cases (4%) with preexisting diabetes mellitus and 10 cases (9.6%) had hypertension. This is comparable to a study done earlier.[15] This explains that preexisting metabolic changes can alter melanocyte regulation thus supporting the concept of metabolic syndrome in vitiligo.[16] and 6% of the cases showed preexisting thyroid dysfunction and was similar to a study done earlier,[17] which explains autoimmune mediated destruction of melanocytes resulting in vitiligo.[3,4] Thyroid function tests were analysed in all the cases and controls. There were 21 cases (20.2%) showed altered TSH levels, 9 cases (8.7%) had altered T4 and 6 cases (5.8%) had altered T3. These findings were similar in a study, in which all the cases had shown altered thyroid hormone levels[18] and in another study only T3 was elevated, TSH and T4 were within normal limits in their study suggesting presence of T3 change is an adaptive response to non-thyroidal illness.[19] In present study these changes were more in females and in middle aged group. When we observed in relation with duration of the disease, the changes of T3 and T4 were more in cases with less than 5 years duration, suggesting possibility of predisposing to develop thyroid disease but TSH levels were found to be elevated in majority of cases irrespective of the disease duration thus, explaining the autoimmune destruction of thyroid follicles from antibodies at any time of the course. Also association with others disease like halo nevi, lichen planus supports this mechanism.[18] This is similar to a study by Arora NV *et al.*, but in their study association with disease duration was not done.[19] In the present study total thyroid function tests abnormalities were noted in 31 cases (29.8%) in which 26 cases (25%) were hypothyroid, 5 cases (4.8%) were hyperthyroid and the remaining 70.19% of the cases were euthyroid. When we compared with healthy individuals only 3(10%) cases showed altered thyroid function tests in comparison to 29.8% of cases ($P<0.05$). As these changes can start many years after the onset of the diseases which require further follow up suggesting its autoimmune pathogenesis. These findings were similar to several other studies done earlier.[8,13,20,21,22] In the present study 4.8% of the cases showed presence of all, thyroid dysfunction, diabetes mellitus and altered lipid profile and were statistically significant. However Chanda M *et al.*, showed abnormal thyroid function tests in 4 cases, diabetes in 3 and high cholesterol in 2 cases.[23] In another study done on type I diabetic patients, hypothyroidism (20%) and vitiligo in 2% of the cases were noted and most of the cases showed associated systemic autoimmune diseases.[24] Thus presence of thyroid dysfunction suggest multifactorial etiology for the occurrence of associated diseases in vitiligo.

CONCLUSION

Present study revealed a significant association between vitiligo and thyroid dysfunction. Middle aged patients and those with early onset of the disease were more commonly affected. In majority the onset of vitiligo preceded that of systemic diseases. However, in few cases the onset of thyroid dysfunction preceded that of vitiligo. Thus the risk for systemic diseases seemed to increase with age in vitiligo and also even in the absence of disease, clinicians should be aware and attentive to the symptoms of thyroid dysfunction, diabetes and dyslipidemia.

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