Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/15903
DOI URL: http://dx.doi.org/10.21474/IJAR01/15903

RESEARCH ARTICLE

A STUDY OF CORRELATION BETWEEN THYROID FUNCTION TEST ABNORMALITIES AND TYPES OF VITILIGO

Dr. Dharaben J. Patel[1], Dr. Nehabahen T. Solanki[2], Dr. Dhwaniben R. Makwana[2] and Dr. Kirti S. Parmar[3]

1. Assistant Professor. Dept of Dermatology, Venereology and Leprosy, Dr M K Shah Medical College,Ahmedabad
2. Senior Resident. Dept of Dermatology, Venereology and Leprosy, Dr M K Shah Medical College,Ahmedabad
3. Professor and Head.Dept of Dermatology, Venereology and Leprosy, Dr M K Shah Medical College,Ahmedabad

Manuscript Info

Manuscript History
Received: 25 October 2022
Final Accepted: 28 November 2022
Published: December 2022

Abstract

Background: Vitiligo is a chronic depigmenting disorder of skin and mucosal membrane which can be associated with many autoimmune cutaneous as well as systemic disorders. Association of vitiligo with various thyroid disorders has been implicated in various studies.

Objectives: To evaluate the correlation of thyroid function test abnormalities in various types of vitiligo.

Method: This is a case control study in which 82 cases of vitiligo and same number of age group and gender matched controls were enrolled. All patients including cases and controls were subjected to thyroid function tests (T3, T4, TSH), thyroid peroxidase (TPO) antibody test. The results were analyzed using chi square test.

Results: Vitiligo cases had M:F ratio of 1:1.93, with the most commonly affected age group was 21-30 years consisting of 51.21% of total cases. The most common subtype of vitiligo was vitiligo vulgaris in 37.80% cases followed by Focal vitiligo in 28.04 % cases. The least common type was Lip-tip vitiligo seen in 2.44% cases. 31.70% cases and 2.44 % controls had TFT abnormalities. On interpretation the most common thyroid disorder found both in cases and controls was subclinical hypothyroidism.

Conclusion: Thyroid abnormality is significantly associated with cases of Vitiligo than control. All the patients of diagnosed as vitiligo should undergo TFT and thyroid antibody evaluation on baseline and periodically.

Introduction:-

Vitiligo is known to mankind since ancient ages. The first reference of the vitiligo was described in 200 BC by Indian Manusmriti where vitiligo was probably mentioned as “SwetaKushtha” [1]. It is known to affect 0.5 – 2% of general population [2]. In a skin of colored people, vitiligo leads to aesthetic blemish and social stigma causing severe psychological distress which includes chronic depression and anxiety [3,4,5]. Various theories are postulated for pathogenesis of vitiligo including autoimmune hypothesis, genetic factors, autotoxic metabolites of melanin synthesis, neural hypothesis, accumulation of neurotoxic substances, free radical injury, deficiency in melanocyte

Corresponding Author:- Dr. Dhwaniben R. Makwana
Address:- Skin Opd, SMS Multispeciality Hospital, Dr M K Shah Medical College, Ahmedabad.

growth factors, and an intrinsic defect of structure and function of melanocytes.[6,7] Supporting the autoimmune hypothesis, association of vitiligo with other autoimmune disorders is observed in various studies which includes cutaneous disorders like alopecia areata, lichen planus, psoriasis, autoimmune connective tissue disorders and various systemic diseases like thyroid disorders, diabetes mellitus, pernicious anemia , addison's disease etc.[8]

This study is conducted to establish the correlation of thyroid function test abnormalities with various types of Vitiligo.

Materials and Methods:-

This was a case control study in which 82 cases of vitiligo and same number of age group and gender matched controls were enrolled. The study was undertaken in the department of Dermatology in a tertiary care center in Gujarat from March 2021 to September 2022 for duration of 18 months. All the diagnosed cases of vitiligo who gave informed written consent were included in the study. Pregnant and lactating females; known case of thyroid disorder were excluded from the study.

All the cases and controls were subjected to detailed history taking including demographic data, history of existing and past skin lesions, history of other systemic disease like diabetes mellitus, hypertension, asthma, dyslipidemia etc. according to preformed detailed proforma. All vitiligo patients were subjected to thorough muco-cutaneous examination including site and size of the lesion, extent of depigmentation, other skin lesions etc. along with woods lamp examination. Patients of vitiligo were categorized under Focal vitiligo, Segmental vitiligo, Acro-facial vitiligo, Mucosal vitiligo, Lip- tip vitiligo and Vitiligo vulgaris. All patients including cases and controls were subjected to thyroid function test (Free T3, T4, TSH) and anti-thyroid peroxidase (TPO) antibodies. All the data was recorded by author and was tabulated under excel sheets, analyzed and compared with chi square test.

Results:-

A total of 82 cases and controls were enrolled in this study that included 28 males (34.14%) and 54 females (65.86%) with Male:Famele ratio 1:1.93.

Age wise distribution of the cases is shown in Table 1. The most commonly affected age group was 21-30 years (51.21%) followed by 31-40 years (15.85%) and 41-50 years (13.41%). The youngest patient was a 9 years old female who presented with segmental vitiligo over face.

Table 1:- Age wise distribution of Vitiligo cases.

Age group	Patients (n=82)	Percentage (%)
0-10 years	02	2.43
11-20 years	08	9.75
21-30 years	42	51.21
31-40 years	31	15.85
41-50 years	11	13.41
51-60 years	06	7.31

The positive family history was found in 11 (13.4%) cases, majority were in first degree relatives. History of pre-existing Diabetes mellitus and Thyroid dysfunction was seen in 4.9% and 6.1% of the cases respectively.

All the cases were categorized under various types as shown in Table 2. Most common type of vitiligo observed was Vitiligo vulgaris (37.80%) followed by Focal vitiligo (28.04%), Acrofacial vitiligo (13.41%), Segmental vitiligo (9.76%). The least common types observed in this study was Lip tip vitiligo(2.44%), Universal vitiligo (3.66%) and Mucosal vitiligo (4.88%).

Table 2:- Distribution of various types of Vitiligo among cases.

Type of vitiligo	No. of patients (n=82)	Percentage(%)
Vitiligo vulgaris	31	37.80
Universal vitiligo	03	3.66
Focal vitiligo	23	28.04
Segmental vitiligo	08	9.76
Acrofacial vitiligo	11	13.41

Lip tip vitiligo	02	2.44
Mucosal vitiligo	04	4.88

We observed variety of Autoimmune cutaneous disorders associated with vitiligo (Table 3), the most common being Atopic dermatitis (8.54%) followed by Alopecia areata (3.65%), Lichen planus and Psoriasis vulgaris (2.44% each), Urticaria, Pemphigus vulgaris and Systemic lupus erythematosus (1.21% each). Co-existance of Pemphigus vulgaris and Focal vitiligo was observed in a 57 year old male patient. A 31 year old female patient, a diagnosed case of Systemic lupus erythematosus also had associated Acrofacial vitiligo.

Table 3:- Association of Autoimmune cutaneous disorders associated with vitiligo.

Associated condition	No. of patients	Percentage
Alopecia areata	03	3.65%
Lichen planus	02	2.44%
Psoriasis vulgaris	02	2.44%
Pemphigus vulgaris	01	1.21%
Atopic dermatitis	07	8.54%
Urticaria	01	1.21%
Systemic lupus erythematosus	01	1.21%

Total 26 cases (31.70%) and 04 controls (2.44%) were found to have abnormal Thyroid function abnormality (TFT). Amongst cases, 17 (65.38%) females and 09 (34.62%) cases were males. Out of controls, 03 (66.6%) were females and 01 (33.4%) was male. The abnormality of thyroid function tests were interpreted as shown in Table 4. Most common abnormality observed was subclinical hypothyroidism (normal free T3 and T4 with raised TSH and negative Anti TPO Ab) seen in total 11 cases (13.41%) in contrast to 2 controls (2.44%). The 2nd most common abnormality seen in cases was subclinical hyperthyroidism and autoimmune thyroiditis in a euthyroid state, 4 cases each (4.88%). The least common observed entities were autoimmune thyroiditis with subclinical hypothyroidism and autoimmune thyroiditis with subclinical hyperthyroidism 1 cases each (1.22%).

Table 4:- Interpretation of abnormality in thyroid function tests.

Sr. No	Free T3	Free T4	Free TSH	Anti TPO Ab	Clinical interpretation	No. of patients	Percentage
1	Normal	Normal	Increased	Negative	Subclinical Hypothyroidism	11	13.41%
2	Normal	Decreased	Increased	Negative	Clinical Hypothyroidism	03	3.66%
3	Normal	Normal	Increased	Positive	Subclinical Hypothyroidism + autoimmune thyroiditis	01	1.22%
4	Normal	Normal	Normal	Positive	Euthyroid + Autoimmune Thyroiditis	04	4.88%
5	Normal	Normal	Decreased	Negative	Subclinical Hyperthyroidism	04	4.88%
6	Normal	Increased	Decreased	Negative	Clinical Hyperthyroidism	02	2.44%
7	Normal	Normal	Decreased	Positive	Subclinical Hyperthyroidism + Autoimmune thyroiditis	01	1.22%

Out of the 4 controls that had abnormal thyroid function tests, 2 had subclinical hypothyroidism (2.44%), subclinical hyperthyroidism and autoimmune thyroiditis was found in 1 (1.22%) control each.

In cases of vitiligo vulgaris, most common abnormality was subclinical hyporthyroidism (3 cases, 3.66%).

Table 5:- Correlation of Thyroid dysfunction in various subtypes of Vitiligo.

	Vitiligo vulgaris	Universal vitiligo	Focal vitiligo	Segmental vitiligo	Acro-facial vitiligo	Lip-tip vitiligo	Mucosal vitiligo	Total
Subclinical Hypothyroidism	06 (23.07%)	01 (3.84%)	03(11.54%)	--	01 (3.84%)	--	--	11 (42.32%)
Clinical Hypothyroidism	01 (3.84%)	--	--	01 (3.84%)	--	01 (3.84%)	--	03 (11.53%)
Subclinical Hypothyroidism + autoimmune thyroiditis	01 (3.84%)	--	--	--	--	--	--	01 (3.85%)
Euthyroid + Autoimmune Thyroiditis	--	01 (3.84%)	01 (3.84%)	01 (3.84%)	--	--	01 (3.84%)	04 (15.38%)
Subclinical Hyperthyroidism	02 (7.69%)	--	--	--	01 (3.84%)	01 (3.84%)	--	04 (15.38%)
Clinical Hyperthyroidism	--	01 (3.84%)	01 (3.84%)	--	--	--	--	02 (7.69%)
Subclinical Hyperthyroidism + Autoimmune thyroiditis	--	--	01 (3.84%)	--	--	--	--	01 (3.85%)

Discussion:-

According to a popular saying in Dermatology "Skin is the mirror to the internal diseases", many cutaneous diseases serve as a marker of systemic diseases. One of such cutaneous manifestation is Vitiligo, which may be associated with many autoimmune and endocrine disorders. Association between vitiligo and thyroid disorder was suggested by Robert back in 1941[9]. Since then, many studies have confirmed the correlation of the same.

In present study, we found higher female (65.86%) preponderance diagnosed with male to female ratio was 1:1.93 which is comparable to the study done by K.V.S. Harikumar et al[10] . In contrast to our study, males were slightly more affected than females in the studies done by Sushmalatha B et al[11] and H Madhu et al[12]. The most commonly affected age group in our study was 21-30 years (51.21%) comparable with the study done by Sushmalatha et al [11] (21 – 30 years consisting 37.73% of total). Higher female preponderance in young age group can be explained because of its cosmetic concern, its effect on psychological state and even relationship issues like rejection faced in marriage proposals and social acceptability sometimes also resulting in divorces.

The most common subtype of vitiligo in present study was Vitiligo vulgaris which consisted 37.80% of total diagnosed cases of vitiligo which was comparable to the study done by H Madhu et al[12] and Sushmalatha et al[11] (43.3%). In our study, Focal vitiligo was the 2nd most common type of vitiligo observed in 28.04% which was similar to study done by H Madhu et al[12] (24%), while it was much higher than the study done by Sushmalatha et al[11] (11%.3). Acrofacial vitiligo was found in 13.41% in present study which was comparable to study done by Sushmalatha et al[11] (15%), while lower than that of the study done by H Madhu et al[12] (25%).

We observed 26 cases and 4 controls with 31.72% prevalence of Thyroid function abnormality in cases and 4.87% of the same in control group. Studies done by H Madhu et al[12] (29.8%) and Sushmalatha et al[11] (32.07%) showed comparable prevalence of thyroid abnormalities in cases; While prevalence of TFT abnormality in control group of our study was less (4.87%) than studies done by H Madhu et al[12] (10%) and Sushmalatha et al[11] (7.54%).

According to TFT (Free T3, T4, TSH) and TPO antibody analysis, hypothyroidism (18.29%) was more common than hyperthyroidism (8.53%). Hypothyroidism was further divided into subclinical hypothyroidism in 11 cases (13.41%), Clinical/overt hypothyroidism in 03 cases (3.66%) and subclinical hypothyroidism with autoimmune thyroiditis in 01 case (1.22%). Hypothyroidism was found in 20.75% cases in study done by Sushmalatha et al[11] and 25% in study done by H Madhu et al[12]. Subtypes of hypothyroidism were not further studied in the both

aforementioned studies. Hyperthyroidism was observed in 07 cases (8.53%) which included subclinical hyperthyroidism in 04 cases (4.88%), Clinical/overt hyperthyroidism in 2 cases (2.44%) and subclinical hyperthyroidism with autoimmune thyroiditis in 01 case (1.22%). Prevalence of Hyperthyroidism was 4.8% and 13.2% in studies done by H Madhu et al[12] and Sushmalatha et al[11] respectively.

In present study, Autoimmune thyroiditis was seen in 06 cases (7.32%) which showed positive TPO antibody. Out of which 4 cases (4.88%) showed subclinical hypothyroidism (increased TSH with normal Free T3 and T4 hormones), 01 case (1.22%) each of Euthyroidism (normal T3, T4, TSH), and subclinical hyperthyroidism(decreased TSH with normal T3 and T4 levels).

Our study revealed higher incidence of TFT abnormalities associated with vitiligo vulgaris 10 cases (12.2%), which was comparable to the study done by Sushmalatha et al[11] (18.8%).

A study done by Afsar et al[13] done exclusively in pediatric age group (2-15 years of age) revealed similar M:F ratio 1:1.7 comparable to our study (1:1.93). While overall prevalence of TFT abnormalities (25.3%) in the same study is less than that of our study (31.72%) which was carried out in age group of 01-60 years of age. In study done by Afsar et al[13], hypothyroidism was present in 18.98% of cases while there was no case of overt or subclinical hyperthyroidism in pediatric age group. In pediatric age group also the positivity of anti TPO antibody was found in 6.3% comparable to present study (7.32%).

Conclusion:-

Our study conclude that there is significant association ($p<0.05$) of Thyroid function abnormalities with cases of vitiligo than control group so all the cases of Vitiligo especially Vitiligo vulgaris should be subjected to TFT and anti thyroid autoantibodies at baseline and should be followed up periodically. Major drawbacks of our study are its limited sample size and duration. Also in our study, the subjects were not followed up as in prospective studies; hence we could not state anything about the vitiligo case who has normal TFT during study period developing thyroid disorder in later age. Further studies on larger scales with regular follow up for longer duration can throw light on the exact correlation between Vitiligo and TFT abnormalities.

References:-

1. Koranne RV, Sachdeva KG. Vitiligo. Int J Dermatol. 1988;27:676-81.
2. J. C. Bystrin, "Serum autoantibodies in vitiligo patients," Clinics in Dermatology, vol. 7, no. 2, pp. 136–145, 1989.
3. Ezzedine K, Grimes PE, Meurant JM, Seneschal J, Leaute-Labreze C, Ballanger F, et al. Living with Vitiligo: results from national survey indicate differences between skin phenotypes. Br J Dermatol. 2015 Aug; 173(2):607-9.
4. Pandave HT. Vitiligo: Is it just a Dermatological disorder? Indian J Dermatol (2008) 53:40-1. Doi:10.4103/0019-5154.39745
5. Ahluwalia J, Correa-Selm LM, Rao BK. Vitiligo: not simply a skin disease. Skinmed (2017) 15:125-7
6. Picardo M, Dell'Anna ML, Ezzedine K, Hamzavi I, Harris JE, Prasad D, et al. Vitiligo. Nat Rev Dis Primers. 2015 Jun;(1):15011
7. Ezzedine K, Lim HW, Suzuki T, Katayama I, Hamzavi I, Lan CC, et al.; Vitiligo Global Issue concensus conference panelists. Revised classification/ nomenclature of Vitiligo and related issues: the Vitiligo global issues concensus conference. Pigment cell melanoma Res. 2012 May;25(3):E1-E13.
8. Cutolo M. Autoimmune Polyendocrine syndromes. Autoimmune Rev (2014) 13:85-9. Doi:10.1016/j.autrev.2013.07.006
9. P. Robert, "ueber die vitiligo", Dermatologica, vol 84, pp.317-319, 1941
10. Kumar KV, Priya S, Sharma R, Kapoor U, Saini M, Bisht YS. Autoimmune thyroid disease in patients with vitiligo: prevalence study in India. EndrocrPract. 2012 Mar-Apr;18(2):194-9. Doi:10.4158/EP/EP11205.OR. PMID:21940277.
11. Sushmalatha B. A study of thyroid profile abnormalities in vitiligo patients in tertiary care center of South India, in Telangana. Int J Res Dermatol 2019;5:611-4
12. Madhu Holeyannavar, SindhuraMandava, JaydevBetkerur. Study of relationship between thyroid dysfunction and vitiligo. Medplus International Journal of Medicine. March 2021; 17(3):70-74
13. Afsar FS, Isleten F. Prevalance of thyroid function test abnormalities and thyroid autoantibodies in children with vitiligo. Indian J EndocrMetab 2013;17:1096-9.