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ASSESSMENT OF ANTI-THYROID PEROXIDASE ANTIBODIES LEVEL IN PATIENTS WITH VITILIGO

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ABSTRACT:
Background: Vitiligo is an idiopathic disorder characterized by depigmented patches in skin because of loss of melanocytes. Death of the pigment cells may be caused by factors from inside and/or outside the cell and there are many potential systems that could be involved. However, the exact cause of destruction of epidermal melanocytes is complex and not yet fully understood. Vitiligo is a relatively common dermatologic finding observed since ancient times. It presents as an idiopathic acquired skin disease, characterized by pearly-white macules of different shapes and sizes, with a tendency to increase in size centrifugally. For this reason, diagnosis is mainly clinically established. Vitiligo often precedes the clinical manifestations of thyroid gland dysfunction. Thus, screening of vitiligo patients to identify at-risk cases for autoimmune thyroid diseases and for early detection of subclinical autoimmune thyroid diseases becomes relevant and necessary. **Objectives:** 1. To assess the level of thyroid auto-antibodies (anti-TPO) in serum of vitiligo patients as a sensitive marker of autoimmune thyroid disease. 2. To assess the correlation between the level of anti TPO with the severity of vitiligo. **Materials & Methods:** This study is a case control study was conducted in Dermatology clinic of Suez Canal University Hospital at Ismailia city Egypt from March 2016 to march 2017. Case group include 40 patients with vitiligo and control group include 40 healthy volunteers who are matched with vitiligo patients for age and gender without vitiligo or family history of vitiligoand informed consent was obtained from every participant in this study. **Result:** the mean and SD of age in the all study population was 38.40 ± 12.86 with a non-statistically significant difference in between the two groups. Genders distribution among the study population was (case group 60% females &40% males while in control group 62.5% females & 37.5% males) with a statistically significant difference in between both groups. Regarding disease severity; the mean (VASI score) was 51.25 ±22.03 in cases with high anti-TPO and 25.10± 19.17 in cases with normal anti-TPO levels with a statistically significant difference in between the two groups and there is a significant correlation between disease severity and other variables in the study including TSH, FT3, and FT4 anti-TPO levels. In our study anti-TPO level was high (+ve) in 7 cases (17.5%) with vitiligo. The mean and SD of anti- TPO was 16.22 ± 39.84 in case group and 0.48± 0.18 in control group, the difference was statistically significant (p value = (0.015). Anti-TPO was significantly correlated with the following variables: FT3, TSH, Disease duration and Disease severity. **Conclusion:** This study confirmed that the commonest thyroid disorder related to vitiligo is autoimmune subclinical hypothyroidism that is shown by the significant increase in positivity of both anti TPO and increase in TSH level in vitiligo patients than in normal controls.

KEYWORDS: Vitiligo, Thyroid, anti TPO, Free T3, TSH, VASI score, Free T4.

INTRODUCTION:

Vitiligo is an idiopathic disorder characterized by depigmented patches in skin because of loss of melanocytes. Death of the pigment cells may be caused by factors from inside and/or outside the cell and there are many potential systems that could be involved. However, the exact cause of destruction of epidermal melanocytes is complex and not yet fully understood.[1] Vitiligo is a relatively common dermatologic finding observed since ancient times. It presents as an idiopathic acquired skin disease, characterized by pearly-white macules of different shapes and sizes, with a tendency to increase in size centrifugally. For this reason, diagnosis is mainly clinically established.[2] Vitiligo can be classified based on the distribution and size of the depigmented area into **Localized**; consists of the following sub-types focal,

segmental and mucosal: in which only the mucous membrane is affected. **Generalized** form involves the following types: acrofacial, vitiligo vulgaris and mixed. **Universal** form corresponds to 50% depigmentation of the skin and/or mucous membranes.[3] Autoimmune theory is the most popular theory. Increased prevalence of autoimmune disorders in association with vitiligo, detection of various auto-antibodies 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 favor of this theory.[2] Thyroid disorders and autoimmune thyroid diseases have been associated with vitiligo and the incidence of clinical or subclinical involvement of the thyroid is more common in patients with vitiligo as compared to healthy subjects. Studies have reported the prevalence of this association to be between 4.4% and 21%.[4] Hashimoto thyroiditis and Graves's disease are the most important and prevalent thyroid diseases associated with vitiligo. Various thyroid autoantibodies including thyroid stimulating antibody, anti-thymoglobulin antibody and antithyroid peroxidase antibody, are detectable in autoimmune thyroid diseases the latter being the most sensitive test for the diagnosis and follow-up of these diseases. Thyroid peroxidase is responsible for the iodination of tyrosine residues in the thymoglobulin molecule. Anti TPO antibody has been shown to mediate thyroid cell destruction in vitro and the presence of this antibody is strongly linked to lymphocytic inflammation and glandular lesion.[5] Vitiligo often precedes the clinical manifestations of thyroid gland dysfunction. Thus, screening of vitiligo patients to identify at-risk cases for autoimmune thyroid diseases and for early detection of subclinical autoimmune thyroid diseases becomes relevant and necessary.[6] Several studies had demonstrated the association of vitiligo with autoimmune diseases especially Autoimmune Thyroiditis. However, there are other studies that have not confirmed this association or have even found unknown patterns of thyroid involvements in patients with vitiligo.[7]

OBJECTIVES: the aim to assess the association of thyroid dysfunction and autoimmune thyroid disorders in vitiligo patients via monitoring thyroid function tests as well as the commonest well known thyroid antibodies {anti - thyroid peroxidase (anti-TPO)}.

1. To assess the level of thyroid auto-antibodies (anti-TPO) in serum of vitiligo patients as a sensitive marker of autoimmune thyroid disease.
2. To assess the correlation between the level of anti TPO with the severity of vitiligo.

MATERIALS AND METHODS: This study is a case control study conducted in Dermatology clinic of Suez Canal University Hospital at Ismailia city Egypt from the year march 2016 to march 2017. Case group include 40 patients with vitiligo and control group include 40 healthy volunteers who are matched with vitiligo patients for age and gender without vitiligo or family history of vitiligo and informed consent was obtained from every participant in this study**.**All included subjects were submitted to full history taking, dermatological examination, VASI score calculation, laboratory investigation including thyroid function tests (FT3, FT4, TSH) and serum anti-TPO level which was assessedfor all subjects by Immunoassay ELISA kits and the case group was divided into two sub-groups; cases with high anti-TPO level and cases with normal anti-TPO level based on laboratory findings and statistical analysis which done using the "SPSS" statistical package.

RESULT:

Our result not showed any significant difference in age groups distribution among cases and controls, in case group (25%) were in age group 20-29 years, (30%) in 30-39 years, (17.5%) in 40-49 years and (27.5%) in ≥50 years, in control group (30%) were in age group 20-29 years, (30%) in 30-39 years, (20%) in 40-49 years and (20%) in ≥50 years; the mean and SD of age in the all study population was 38.40 ± 12.86 with a non-statistically significant difference in between the two groups. Genders distribution among the study population was (case group 60% females &40% males while in control group 62.5% females & 37.5% males) with a statistically significant difference in between both groups. Regarding disease severity; the mean (VASI score) was 51.25 ±22.03 in cases with high anti-TPO and 25.10± 19.17 in cases with normal anti-TPO levels with a statistically significant difference in between the two groups and there is a significant correlation between disease severity and other variables in the study including TSH, FT3, and FT4 anti-TPO levels. In our study positive thyroid auto-antibodies (anti-TPO) level was detected in 07 (17.5%) patients with vitiligo among them 04 cases are male and 03 cases were females, out of them five cases (71.4%) had abnormal thyroid function among them 03 patients had subclinical thyroid disease, 02 cases had hashimoto's thyroiditis, but the other two case had thyroid autoimmunity (high anti TPO without hormonal changes).The mean and SD of anti- TPO was 16.22 ± 39.84 in case group and 0.48± 0.18 in control group, the difference was statistically significant (p value 0.015). Anti-TPO was significantly correlated with the following variables: FT3, TSH, Disease duration and Disease severity.

Table* (1)*: Age group and Gender distribution among study groups (n=80 subjects).

Variable	Cases Group		Control Group		p-value
Age group	**Frequency**	**Percent**	**Frequency**	**Percent**	
20-29 y	10	25%	12	30%	0.86
30-39 y	12	30%	12	30%	
40-49 y	07	17.5%	08	20%	
≥50y	11	27.5%	08	20%	
Total	40	100%	40	100%	
Gender distribution					**0.036**
Male	16	40%	15	37.5%	
Female	24	60%	25	62.5%	
Total	40	100%	40	100%	

Table (1) shows that there was a nearly similar distribution of cases and controls group among age groups and Sex distribution.

Table (2): Chronic disease/s distribution in between study groups (n=80 subjects).

Chronic disease	Controls Group		Cases Group		Chi-square p-value
	Frequency	**Percent**	**Frequency**	**Percent**	
Yes	7	17.5 %	10	25.0%	0.293
No	33	82.5 %	30	75.0 %	
Total	40	100.0%	40	100.0%	

Table (2) Shows that there was statistically significant difference of cases in comparison to controls regarding chronic disease/s in the study population with a non-statistically significant difference in between the groups.

Table (3): Family history of vitiligo in the study groups (n=80 subjects).

Variable	Cases Group		Control Group		p-value
+ve family history	**Frequency**	**Percent**	**Frequency**	**Percent**	
Absent	30	75%	40	100%	***0.001***
Present	10	25%	0	0.0%	
Total	40	100%	40	100%	

Table (3) Shows that there was statistically significant difference of cases in comparison to controls group regarding positive family history of vitiligo in the study population.

Table (4): Comparison of type of Vitiligo and koebner fenomeen in patients with positive and negative anti TPO (n=40).

Type of Vitiligo	Patients with -ve Anti TPO [n=33 (82.5%)]		Patients with +ve Anti TPO [n=7 (17.5%)]	
	No.	%	No.	%
Generalized a. Acrofacial b- Vulgaris c- Mixed	**28 cases** 4 20 4	**(70.0%)** 10.0% 50.0% 10.0%	**6** 0 3 3	**(15.0%)** 0.0% 7.5% 7.5%
Localized a. Focal b. Segmental	**4 cases** 2 2	**(10.0%)** 5.0% 5.0%	**0** 0 0	**(0.0%)** 0.0% 0.0%
Universals	**1**	**(2.5%)**	**1**	**(2.5%)**
Total	**33**	**(82.5%)**	**7**	**(17.5%)**
Kobner's phenomenon present in (4 cases 10%)				
Koebner feno. (present) ***Koebner feno.*** (absent)	4 29	**10.0%** 72.5%	0 7	00.0% 17.5%
Total	**33**	**(82.5%)**	**7**	**(17.5%)**

Table (4) shows that based on clinical characteristics, generalized type was present in 70 % of cases, 50% of them was of vulgaris variety. Kobner's phenomenon was observed in 10.0% of cases.

Table (5): Comparing of mean and SD some important variables among study groups (n=80 subjects).

Variable	Cases	Controls	p-value
	Mean ± SD	Mean ± SD	
Age (years)	40.30± 12.42	36.50 ± 13.	0.19
Body mass index (kg/m^2)	27.77 ± 3.26	27.02 ± 1.	0.18
Free T3 (ng/dL)	85.42 ± 17.74	92.75 ± 10.00	***0.26***
Free T4 (ng/dL)	7.42± 2.19	7.61± 1.33	0.63
TSH (µIU/mL)	3.40 ± 3.17	0.69 ± 0.41	***<0.001***
Anti-TPO	16.23± 39.84	0.5 ± 0.18	***0.015***
Age at Onset of Disease (years): Mean ± SD		23.70 ± 11.676	
Duration of Disease (years): Mean ± SD		15.80 ± 13.661	
Disease Severity Score (VASI): Mean ± SD		28.5013 ± 21.399	

Table (5) shows the mean and SD of case and control group whichshows a statistically significant difference in between the study groups concerning TSH, free T3, and anti-TPO.

Table (6): Comparison of mean and SD of some important variables among case group in respect to anti-TPO levels (n=40 subjects).

Variable	Normal TPO (n=33)	High TPO (n=7)	p-value
	Mean ± SD	Mean ± SD	
Age (years)	41.03± 12.77	36.86± 10.74	0.43
Free T3 (ng/dL)	90.67± 13.04	60.71±16.56	***<0.001***
Free T4 (ng/dL)	8.24± 0.78	3.53±2.57	***<0.001***
TSH (µIU/mL)	2.25± 0.96	8.83± 4.34	***<0.001***
Anti-TPO	0.78± 0.49	89.01± 53.11	***<0.001***
Age at onset	24.21± 12.10	21.21±9.78	0.55
Duration of disease	15.91± 14.12	15.29± 12.23	0.91
Disease severity (VASI)	25.10± 19.17	51.25 ±22.03	***0.008***

Table (6) is showing the comparison of various variables between cases with normal and high anti-TPO levels.

Table (7): **Disease severity among case group according to VASI score (n=40):**

Disease severity	Total number of vitiligo patient(n=40)				p-value
	Patients with normal anti-TPO [n=33 (82.5%)]		Patients with high anti-TPO [n=7 (17.5%)]		
	No.	%	No.	%	
Mild (score 2-<24)	20	50.0 %	0	00.0%	**0.008**
Mild to moderate(score 24-<48)	8	20.0 %	4	10.0%	
Moderate (score 48-<72)	4	10.0%	2	5.0%	
Sever (score 72-100)	1	2.5%	1	2.5%	
Total	**33**	**(82.5%)**	**7**	**(17.5%)**	

Table (7) is showing frequency of Disease severity among case group according to VASI score with normal and high anti-TPO levels and that there was statistically significant difference P value 0.005.

Table (8): Distribution of Anti-thyroid peroxidase (anti-TPO) levels among study groups (n=80 subjects).

Anti - TPO	Cases		Controls		p-value
	Frequency	%	Frequency	%	
Normal (< 40) IU/ml	33	82.5%	40	100%	***0.015***
High (> 40) IU/ml	7	17.5%	0	0.0%	
Total	40	100%	40	100%	

Table (8) shows that only seven cases (7/40) showed a higher than normal (anti-TPO) levels within the study population with statistically significant difference found between the cases and controls p value = ***0.015***.

Table (9): Distribution of cases with high (anti-TPO) levels in case group **{n=7/40 cases (17.5%)}.**

Type of thyroid dysfunction	Male	Female	%
	No. & %	No. & %	
hashimoto's thyroiditis	One case (14.28%)	One case (14.28%)	(28.56%)
Subclinical hypothyroidism	One case (14.29%)	Two cases (28.58%)	(42.86 %)
Thyroid autoimmunity without hormonal changes	One case (14.29%)	One case (14.28%)	(28.58%)
Total	3 cases (42.85 %)	4 cases (57.15 %)	(100.00 %)

Table (9): Shows distribution of positive cases with high (anti-TPO) among case group, two cases (28.57%) had hashimoto's thyroiditis (TSH ≥10 micro U/ml), three cases (42.86 %) had Subclinical hypothyroidism (TSH >5 & ≤10 micro U/ml).

Table (10): Correlations of the some important variables among the case group **(n=40).**

Variable 1	Variable 2	R	p-value
Anti--TPO	Free T3	-0.525	***0.001***
Anti--TPO	TSH	0. 609	***<0.001***
Anti--TPO	Free T4	-0.550	***<0.001***
Free T3	Free T4	0.685	***<0.001***
Disease severity	Free T3	-0.495	***<0.001***
Disease severity	TSH	0. 707	***<0.001***
Disease severity	Anti--TPO	0.381	***<0.001***
Disease severity	Free T4	-0.243	***0.030***
Interpretation of correlation coefficient "r" 0 to 0.3 Weak correlation●>0.3 to 0.6 moderate correlation >0.6 to 0.9 strong correlation●1 perfect correlation			

Table (10) shows correlations between some variables among the cases group. Significance within a group of quantitative variables in between 2 groups was calculated using Student's t-test and between groups of qualitative data, chi-squared-test ($\chi 2$) was used.

DISCUSSION:

Our result not showed any significant difference in age groups distribution among cases and controls, in case group (25%) were in age group 20-29 years, (30%) in 30-39 years, (17.5%) in 40-49 years and (27.5%) in ≥50 years, in control group (30%) were in age group 20-29 years, (30%) in 30-39 years, (20%) in 40-49 years and (20%) in ≥50 years; the mean and SD of age in the study population was 38.40 ± 12.86 with a non-statistically significant difference in between the two groups. Genders distributed among the study population was (case group 60% females &40% males while in control group 62.5% females & 37.5% males) with a statistically significant difference in between both groups. This trend was different to that noted by **Dash, 2015** who reported that females population accounted for (59%) of study participants with vitiligo and presented at an earlier age as compared to the males.[8] Another study **Altaf, 2010** reported that female's with the mean age of 19.61±11.054 years formed the majority of study participants, they suggested that vitiligo being an autoimmune disease, and could be more common in females.[9] BMI among study population, the mean and SD was 27.77 ± 3.26in case group and 27.02 ± 1.19in control group, with a non-statistically significant difference in between the two groups. The mean and SD of duration of the disease (years) was15.29± 12.23 in vitiligo cases with high (+ve) anti TPO levels, while in vitiligo cases with normal (-ve) anti-TPO level it was 15.91± 14.12, and the mean age of onset of vitiligo in our study was 23.70 ± 11.68. **Zamanian study 2014;** found the average age of vitiligo onset was 20 years old.[8] In ***Jishna 2017***,[5] a study conducted in India the mean age of onset of vitiligo was 26 years, and in Brazil **(Holthausen-NunesH ., 2011)** found the mean age of onset of vitiligo in the fourth decade of life.[11] These data indicate that vitiligo can occur at any age. Regarding disease severity; the mean (VASI score) was 51.25 ±22.03in cases with high anti-TPO and 25.10± 19.17 in cases with normal anti-TPO levels with a statistically significant difference in between the two groups. Our results showed a significant correlation between disease severity by VASI and other variables in the study including TSH, FT3, and FT4 anti-TPO levels. Regarding the clinical characteristic and type of the disease distribution among case group, 34 cases (85%) were generalized type, of them (23 case [57.5%] were vulgaris, 04 cases [10%] was acrofacial and 06 cases [15%] was mixed), and 04 cases [10%] were localized type (half of them was focal and other half was segmental), and the remaining 2 cases [5.2%] was of universal type. ***Jishna* study 2014**; reported that vulgaris type was 51% of cases.[11] **Gey 2013, Nunes and Esser in 2011**, mentioned a finding similar to ours in which vitiligo vulgaris was the commonest type (71%).[12,13] But in **Zamanian study, 2014** they found that 6.7% of patients had generalized vitiligo and 11.1% had the localized type.[8] This is probably due to early medical treatment, immediately after the appearance of the first lesion in the child. The mean Free T3 (FT3) was 85.42 ± 17.74& 92.75 ± 10.00 (ng/dL), the mean Free T4 (FT4) was 7.42 ± 2.19& 7.61± 1.33 (ng/dL), the mean TSH was 3.40 ± 3.17& 0.69 ± 0.41 (µIU/mL) in cases and controls respectively. There is a significant increase in TSH level among vitiligo patients when compared to the control group, the mean TSH was 3.40 ± 3.17& 0.69 ± 0.41 (µIU/mL) respectively and p value was*<0.0001*. Moreover, the mean and SD of TSH was 8.83± 4.34 in cases with high anti-TPO and 1.39± 1.05 in cases with normal anti-TPO levels with statistically significant difference in between the two sub-groups. Our results showed a significant correlation between TSH and other variables in the study including anti-TPO levels and disease severity by VASI. **Jishna 2017** reported that TSH was significantly higher in (27%) of vitiligo patients.[11] The same result was reported by **Holthausen -Nunes; 2011**(22.4%) and **Ghaly study 2011**.[11,14] TSH values considered to be the best indicator of thyroid disease in vitiligo **(Kumar, 2012).**[15] The mean and SD of FT3 was 60.71±16.55 in cases with high anti-TPO and 91.81± 11.45 in cases with normal anti-TPO levels with statistically significant difference in between the two sub-groups (p value <0.001). Our results also showed a significant correlation between FT3 and other variables in the study including disease severity by VASI and anti-TPO levels. The mean and SD of FT4 was 3.54± 2.57in cases with high anti-TPO and 7.90± 1.15 in cases with normal anti-TPO levels with statistically significant difference in between the two sub-groups (p value 0.001). In our study the level of FT4 was below normal in the cases with clinical hypothyroidism (Hashimoto's thyroiditis). Our results showed a significant correlation betweenFT4 and other variables in the study including disease severity by VASI. The same result was reported by **Ghaly, 2011** and by **Zamanian study 2015,**[14,10] which showed that there was no significant difference in the serum mean levels of T4 in vitiligo patients compared to the control group, which coincides with findings.In our study positive thyroid auto-antibodies (anti-TPO) level was detected in 07 (17.5%) patients with vitiligo among them 04 cases are male and 03 cases were females, out of them five cases (71.4%) had abnormal thyroid function among them 03 patients had subclinical thyroid disease (TSH >5 & ≤10 micro U/ml), 02 cases had hashimoto's thyroiditis (TSH ≥10 micro U/ml), but the other two case had thyroid autoimmunity (high anti TPO without hormonal changes).The mean and SD of anti- TPO was 16.23 ± 39.48 in case group and 0.50± 0.18 in control group, the difference was statistically significant (p value = (0.015). Our results also showed a significant correlation between anti-TPO and other variables in the study including duration of disease and disease severity by VASI. **Attwa study 2014** reported that anti-thyroid peroxidase antibody level was detected in (26%) of vitiligo patients in comparison to (8%) in controls, it was statistically significant (p=0.001),[16] Similar result was reported by **Ghaly, 2011**, in their results there was significant increase in anti- TPO among the study group, and there was an association between vitiligo and autoimmune

thyroid diseases, especially autoimmune hypothyroidism.[14] In agreement with our results, many studies reported statistically significant increased levels of anti-TPO in vitiligo patients compared with controls as **Kasumagic-Halilovic. 2011**,[17] **Kumar 2012,**[15] **Dash 2015.**[6] ***Jishna* 2017** also found higher prevalence of thyroid antibodies in vitiligo patients (36%).[5] **Yang, 2014**[2] found that in subsequent clinical follow-up about 70% of vitiligo patients with positive anti-TPO were diagnosed as having autoimmune thyroid diseases at average 2.5 years. This study reveals a positive correlation between the mean serum levels of FT3, FT4 and vice versa, also between the mean serum levels of anti-TPO, FT3, TSH. We have demonstrated an increased incidence of autoimmune thyroid disorders mostly autoimmune subclinical hypothyroidism in vitiligo patients, based on the significant increased positivity in both anti-TPO in vitiligo patients than controls. Moreover; Anti-TPO was significantly correlated with the following variables: FT3, TSH, Disease duration and Disease severity by VASI. Similar result was reported by **Ghaly, 2011**.[14]

CONCLUSION

Vitiligo is frequently associated with diseases of autoimmune origin, especially thyroid disorders. This study confirmed that the commonest thyroid disorder related to vitiligo is autoimmune subclinical hypothyroidism that is shown by the significant increase in positivity of both anti thyroid peroxidase and significant increase in TSH levels in vitiligo patients than in normal controls. All these findings support the role of autoimmune theory in vitiligo as well as the strong association between vitiligo and autoimmune thyroid dysfunction and according to our result; vitiligo patients had significantly higher level of anti-TPO in comparison to the control group. Considering the fact that vitiligo usually precedes the onset of thyroid dysfunction and anti-TPO being a sensitive tool for the detection of autoimmune thyroid disorders including Graves' disease and Hashimoto's thyroiditis, periodic follow-up of vitiligo patients for detecting thyroid diseases is further emphasized especially in patients with increased level of anti-TPO.

RECOMMENDATIONS

1. Further studies are recommended on a larger sector, to solidify the relation between autoimmune thyroid dysfunction and vitiligo in the Egyptian population, and to throw more insight at which type of thyroid dysfunction is more commonly to associated with vitiligo.
2. Anti - TPO can be considered as a screening tool for autoimmune thyroid disorders in vitiligo patients.
3. Considering the fact that vitiligo usually precede the onset of thyroid dysfunction, periodic follow up of vitiligo patients for detecting thyroid diseases is further emphasized especially with increased level of anti-TPO.
4. We recommend that any patient has vitiligo disease must be examined for:

a. Clinical and dermatological manifestations of thyroid dysfunction (hypothyroidism or hyperthyroidism).
b. Laboratory measurements of TSH and anti-TPO antibody in all the patients with vitiligo.
c. All patients who have a high level of anti-TPO antibodies (as it is the most sensitive tool for detection of AITDs) should be followed-up periodically with TSH to achieve early diagnosis and management of subclinical and overt thyroid disease.

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REFERENCES:

1. **Reimann E, Kingo K, Karelson M, Reemann, P, Loite U, Sulakatko H et al. (2012):** The mRNA expression profile of cytokines connected to the regulation of melanocyte functioning in vitiligo skin biopsy samples and peripheral blood mononuclear cells. Hum Immunol, 73: 393-398.
2. **Yang L, Wei Y, Sun Y, et al. (2015):** Interferon-gamma Inhibits Melanogenesis and Induces Apoptosis in Melanocytes: A Pivotal Role of CD8+ Cytotoxic T Lymphocytes in Vitiligo. ActaDermVenereol, 95(6): 664–70. 10.2340/ 00015555-2080.
3. **Taieb, A, Gauthier, Y, Cario Andre, M (2013):** A critical appraisal of vitiligo etiologic theories. Is melanocyte loss a melanocytorrhagy? Pigment Cell Res, 16: 322–332.
4. **Bertolotti, A, Boniface, K, Vergier, B et al. (2014):** Type I interferon signature in the initiation of the immune response in vitiligo. Pigment Cell Melanoma Res, 27: 398–407
5. **Jishna P., Binitha M. P., Abdul Latheef E. N., Anilakumari V. P. (2017):** Prevalence of thyroid dysfunction and anti-thyroid peroxidase antibodies in vitiligo patients , *Int J Res Dermatol, 2017; 3(1): 140-144.DOI: 10.18203/ issn.2455-4529.*
6. **Boissy RE and Picardo M (2017):** On the pathophysiology of vitiligo: Possible treatment options. Indian J DermatolVenereolLeprol [cited 2017 Apr 9], 78: 24-9.
7. **Picardo M, Dell'Anna ML, Ezzedine K, et al. (2015):** Vitiligo. Nat Rev Dis Primers, 1: 15011. 10.1038/nrdp.2015.11.
8. **Dash R, Mohapatra A, Manjunathswamy BS.** Anti-Thyroid Peroxidase Antibody in Vitiligo: A Prevalence Study. Journal of Thyroid Research, 2015; 2015: 192736. doi:10.1155/2015/192736.
9. **Altaf H, Shah IH, Ahmad QM (2010):** Evaluation of thyroid function and presence of anti-thyroid peroxidase antibodies in patients with vitiligo. Egyptian dermatol Online J, 6: 3.

10. **Zamanian A &Mobasher P , Ansar A, Manuchehri S , Ghazaleh J. (2014):** Autoimmune Thyroid Disorders in Patients With Vitiligo. Stem Cell Research. doi:10.17795/jssc22113.
11. **Holthausen-Nunes H, Esser LMH. (2011):** Vitiligo epidemiological profile and the association with thyroid disease. An Bras Dermatol, 86: 241-8.
12. **Gey A, Diallo A, Seneschal J, Léauté-Labrèze C, Boralevi F, Jouary T, Taieb A, &Ezzedine K (2013):** 'Autoimmune thyroid disease in vitiligo: multivariate analysis indicates intricate pathomechanisms', *British Journal of Dermatology*, 168(4): 756-761. doi: 10.1111/bjd.12166.
13. **Nunes DH and Esser LM (2011):** Vitiligo epidemiological profile and the association with thyroid disease. An Bras Dermatol, 86: 241-8.
14. **Ghaly Ireny F. H. (2011):** Thyroid Dysfunction and Thyroid Antibodies in Egyptian Vitiligo Patients (Master's thesis). Retrieved from Egyptian Universities Libraries Consortium (EULC) Database. (Accession No. 11070391).
15. **Kumar A, Agrawal S, Dhali TK and Majhi SK (2014):** Comparison of oxidant-antioxidant status in patients with vitiligo and healthy population. Kathmandu Univ Med J (KUMJ); 12: 132–136.
16. **Attwa E, Nofal A, Khater MH, Gharib K, Khalifa N (2014):** Vitiligo and Associated AutoimmSharkiaGovernate, Egypt. Pigmentary Disorders 2: 154. doi:10.4172/2376-0427.1000154.
17. **Kasumagic- Halilovic E, Prohic A, Begovic B and Ovcina-Kurtovic N.** Association between Vitiligo and Thyroid Autoimmunity. Journal of Thyroid Research Volume 2011, Article ID 938257, 3 pages.