



## ASSOCIATION OF VITILIGO WITH THYROID DYSFUNCTION AND DIABETES MELLITUS ALONG WITH ASSESSMENT OF QUALITY OF LIFE

### Dermatology

**Dr Shruti Kharbanda\*** Junior Resident, Department of Dermatology, Venerology and Leprosy, Swami Vivekanand Subharti University, Meerut. \*Corresponding Author

**Dr Arvind Krishna** Professor & Head, Department of Dermatology, Venerology and Leprosy, Swami Vivekanand Subharti University, Meerut.

**Dr Anup Kumar Tiwary** Assistant Professor, Department of Dermatology, Venerology and Leprosy, Swami Vivekanand Subharti University, Meerut.

### ABSTRACT

**Aim:** To associate vitiligo with thyroid dysfunction and diabetes mellitus along with assessment of quality of life.

**Material and method:** A case control study was conducted on 40 clinically diagnosed patients of vitiligo and 40 healthy volunteers attending the out-patient department of Dermatology, Venereology and Leprosy of Chhatrapati Shivaji Subharti Hospital, Meerut. A detailed history was taken with reference to the age at onset, duration, site of onset, history of atopy, history of other autoimmune diseases, family history of vitiligo and personal or family history of common systemic diseases associated with vitiligo (alopecia areata, thyroid dysfunction or diabetes mellitus) and Vitiligo Area Severity Index (VASI). The Dermatology Life Quality Index (DLQI) and Children Dermatology Life Quality Index (CDLQI) questionnaire was designed for use in adults and children respectively.

**Results:** The most common site of lesion among study population was lower leg (27.5%). Prevalence of Hypothyroidism was observed in 38% of localized vitiligo and 37% of generalized vitiligo and the difference was statistically insignificant. There was significant positive correlation between mean DLQI and VASI score.

**Conclusion:** Our study findings in conjunction with others clearly establish that it is very useful to screen all patients with vitiligo for thyroid dysfunction and diabetes mellitus.

### KEYWORDS

QoL, VASI, Vitiligo

### INTRODUCTION:

Vitiligo, a common acquired depigmenting disorder, affects approximately 1% of the population worldwide and is clinically characterized by well-demarcated areas of depigmentation as a result of loss of melanocytes [1]. Average age of onset occurs around the second to the third decade of life [2]. Adults and children of both genders are equally affected, but some studies indicate a slightly increased prevalence of cases among females [3].

Thyroid functional disorders and autoimmune thyroid diseases have been reported in association with vitiligo and the incidence of clinical and subclinical thyroid involvement is more common in vitiligo patients than healthy subjects [4]. Elevated levels of anti-TPO are seen in more than 90% cases of Hashimoto thyroiditis and about 75% of Graves disease cases. This figure is only 10% in healthy people although it may reach 30% in the elderly [5].

The association between diabetes and vitiligo has been proposed by several studies. The occurrence of vitiligo and diabetes mellitus may be the result of autoimmune mechanisms in the same patient. Long standing diabetes mellitus impairs melanocytes, resulting in anti-melanocyte antibody formation and destruction of melanocytes which causes vitiligo [6]. Patients with vitiligo often suffer from poor body image along with low self-esteem, and experience discomfort, inferiority, and discrimination in social and societal relationships, leading ultimately to an impaired Quality Of Life (QOL) [7].

In India, very few studies have focused on the association of thyroid dysfunction and diabetes mellitus with vitiligo. Though many studies have been successful in quantifying the negative impact of vitiligo on Quality of Life, its direct correlation with disease severity remains equivocal. Hence, this study was conducted on association of vitiligo with thyroid dysfunction and diabetes mellitus along with assessment of quality of life.

### MATERIAL AND METHOD:

A case control study was conducted on 40 clinically diagnosed patients of vitiligo and 40 healthy volunteers attending the out-patient department of Dermatology, Venereology and Leprosy of Chhatrapati Shivaji Subharti Hospital, Meerut within 1 years 4 months of approval by the university (From November 2018 to February 2020). Ethical committee clearance was obtained. All new cases of vitiligo aged 5 years and above presenting to Dermatology OPD and patients with clinically diagnosed cases of vitiligo were included in the study.

Pregnant women and patients on Anti-Thyroid drugs, thyroid replacement therapy, previous history of thyroid surgery or irradiation were excluded from the study.

A detailed history was taken with reference to the age at onset, duration, site of onset, history of atopy, history of other autoimmune diseases, family history of vitiligo and personal or family history of common systemic diseases associated with vitiligo (alopecia areata, thyroid dysfunction or diabetes mellitus) and Vitiligo Area Severity Index (VASI).

Criteria for the diagnosis of DM include a fasting plasma glucose  $\geq 126$  mg/dL. The normal range for serum T3 is 70-200 ng/dl, for serum T4 is 5-13 ng/dl and for serum TSH is 0.5-5 micro U/ml. A diagnosis of hypothyroidism is made when thyroid function tests showed a raised TSH with or without low T3/T4 levels. Hyperthyroidism will be diagnosed if T3/T4 levels were raised with associated lowered levels of TSH. Antithyroid antibodies were assayed by enzyme-linked immunosorbent assay using commercial kits.

The Dermatology Life Quality Index (DLQI) [8] questionnaire was designed for use in adults, i.e. patients over the age of 18. The Children s Dermatology Life Quality Index (CDLQI) [8] questionnaire was designed for use in children, i.e. patients between the age of 5 – 18 years.

### STATISTICAL ANALYSIS:

The significance of study parameters was calculated by Chi Square test, unpaired t test for continuous data. The statistical software used was SPSS software version 27.0.

### RESULTS:

Both the groups were comparable w.r.t. age and gender. There was higher number of female patients in case as well as control group. The most common site of lesion among study population was lower leg (27.5%) followed by arm (22.5%), trunk (17.5%), neck (10%) and face (7.5%) and the difference was statistically insignificant (table 1).

**Table 1: Site involved among study population**

		Group		Total
		Cases	Controls	
Arm	Count	9	0	9
	%	22.50%	0.00%	22.50%
Trunk	Count	7	0	7
	%	17.50%	0.00%	17.50%

Lower leg	Count	11	0	11
	%	27.50%	0.00%	27.50%
Lower abdomen	Count	2	0	2
	%	5.00%	0.00%	5.00%
Face	Count	3	0	3
	%	7.5%	0.00%	7.5%
Lips	Count	2	0	2
	%	5.00%	0.00%	5.00%
Scalp	Count	1	0	1
	%	2.50%	0.00%	2.50%
Neck	Count	4	0	4
	%	10.00%	0.00%	10.00%
Buttock	Count	1	0	1
	%	2.50%	0.00%	2.50%
Total	Count	40	00	40
	%	100.00%	100.00%	100.00%

Prevalence of Hypothyroidism was observed in 38% of localized vitiligo and 37% of generalized vitiligo and the difference was statistically insignificant (table 2).

Prevalence of diabetes was observed in 31% of localized vitiligo and 26% of generalized vitiligo and the difference was statistically insignificant (table 3).

**Table 2: Type of vitiligo vs Hypothyroidism among study population**

			Hypothyroidism		Total
			Present	Absent	
Type of vitiligo	Localized	Count	5	8	13
		%	38%	62.00%	100.00%
	Generalized	Count	10	17	27
		%	37.00%	63.00%	100.00%
Total		Count	15	25	40
		%	38.00%	63.00%	100.00%

Chi square test, P value- 0.93

**Table 3: Type of vitiligo vs Diabetes among case population**

			Diabetes		Total
			Present	Absent	
Type of vitiligo	Localized	Count	4	9	13
		%	31%	69.00%	100.00%
	Generalized	Count	7	20	27
		%	26.00%	74.00%	100.00%
Total		Count	11	29	40
		%	28.00%	73.00%	100.00%

Chi square test, P value- 0.74

Mean DLQI was significantly higher in VASI score more than 5 as compared to DLQI seen in less than 5 VASI score. There was significant positive correlation between mean DLQI and VASI score (table 4).

**Table 4: Correlation between VASI and DLQI**

VASI Score	DLQI		P value
	Mean	SD	
Less than 5	6.42	2.1	0.001
More than 5	10.11	3.6	
Variables			VASI
Pearson Correlation With DLQI score			0.895(*)
Sig. (2-tailed)			0.001

**DISCUSSION:**

In the present study, there is higher number of female patients as compared to male patients in cases and control group. Shah et al [9] and

Martis et al [10] showed slightly higher prevalence in female population of 68.4% and 55% respectively. The number of female vitiligo patients was found to be higher than male because women notice the change in appearance and approach the doctors sooner than men due to the social stigma in the community, young females tend to report earlier due to matrimonial anxiety.

In the present study, the most common site of lesion among study population is lower leg (27.5%). Most common site of onset was lower extremity. Similar findings were also seen in a study by Shajil et al [11]. However, Alissa et al [12], showed face was the most common site of onset. One study by Karelson et al [13], of 155 adult patients showed most common site of onset was upper limb.

In the present study, prevalence of Hypothyroidism is observed in 38% of localized vitiligo and 37% of generalized vitiligo and the difference is statistically insignificant. In the present study, hypothyroidism is present significantly higher in cases (37.5%) as compared to controls (5%) and is statistically significant. Similar higher prevalence of hypothyroidism resulting from autoimmune thyroiditis in vitiligo patients has been reported by Akay et al [14], (31%) and Iacovelli et al [15], (16%) though a lower occurrence was noted by Narita et al [16] and Handa et al [17].

In the present study, diabetes is present significantly higher in cases (27.5%) as compared to controls (10%) and is statistically significant. In the study by Vijayasingam et al [18], the prevalence of vitiligo in similar subjects was 3.3%, and in the study by Mahajan et al [19] of 100 diabetics with 98% of them being Type 2 diabetics, vitiligo was seen in 4% of the patients, whereas in the age- and sex-matched controls, it was 1%.

There is significant positive correlation between mean DLQI and VASI score. Similarly study by Hammam et al [20], showed positive correlation between VASI score and total DLQI score. The limitation of present study is small sample size.

**CONCLUSION:**

Our findings establish a clear association between vitiligo, autoimmune hypothyroidism and diabetes mellitus. These associations indicate that vitiligo shares a common genetic etiologic link with these autoimmune disorders.

Vitiligo affects QOL in majority of vitiligo patients irrespective of extension of involvement (Generalized/localized vitiligo), so patients having localized vitiligo also have significant effect on quality of life. Hence patients of vitiligo require more aggressive and empathic attitude from a dermatologist to cure/improve the so called chronic cosmetic disease.

**REFERENCES**

- Tie A, Picardo M. The definition and assessment of vitiligo: A consensus report of the Vitiligo European Task Force. *Pigment Cell Res* 2007;20:27-35.
- Barona MI, Arrunategui A, Falabella R, Alzate A. An epidemiologic case control study in a population with vitiligo. *J Am Acad Dermatol*. 1995;33:621-5.
- Steiner D, Villas RT, Bedin V, Steiner T, Moraes MB. Vitiligo. *An Bras Dermatol*. 2004;79:335-51.
- Hegedus L, Heidenheim M, Gervil M, Hjalgrim H, Hoier-Madsen M: High frequency of thyroid dysfunction in patients with vitiligo. *Acta Derm Venereol* 1994; 74:120-3.
- Ai J, Leonhardt MJ, Heymann RW: Autoimmune thyroid diseases. Etiology, Pathogenesis, and dermatologic manifestations. *J Am Acad Dermatol* 2003; 48:641-59.
- Gould I, Gray R, Urbaniak S, et al. Vitiligo in diabetes mellitus. *Br J Dermatol* 1985;113:153-5
- Kent G, Al Abadie M. Factors affecting responses on Dermatology Life Quality Index items among vitiligo sufferers. *Clin Exp Dermatol* 1996;21:330-3.
- Finlay AY. Quality of life indices. *Indian J Dermatol Venereol Leprol*. 2004;70:143-8.
- Shah H, Mehta A, Astik B. Clinical and sociodemographic study of vitiligo. *Indian J Dermatol Venereol Leprol*. 2008;74:701.
- Martis J, Bhat R, Nandakishore B, Shetty JN. A clinical study of vitiligo. *Indian J Dermatol Venereol Leprol*. 2002;68:92-3.
- Shajil EM, Agrawal D, Vagadia K, Marfatia YS, Begum R. Vitiligo: Clinical profiles in Vadodra, Gujarat. *Indian J Dermatol*. 2006;51:100-4.
- Alissa A, Al Eisa A, Huma R, Mulekar S. Vitiligo-epidemiological study of 4134 patients at the National Center for Vitiligo and Psoriasis in Central Saudi Arabia. *Saudi Med J*. 2011;32:1291-6.
- Karelson M, Kingo K, Salum T, Koks S, Silm H. An adult's vitiligo in Estonia: Study of 155 patients. *Open Dermatol J*. 2009;3:68-72.
- Akay BN, Bozkir M, Anadolu Y, Gullu S. Epidemiology of vitiligo, associated autoimmune diseases and audiological abnormalities: Ankara study of 80 patients in Turkey. *J Eur Acad Dermatol Venereol*. 2010;24:1144-50.
- Iacovelli P, Sinagra JL, Vidolin AP, Marenza S, Capitatio B, Leone G, et al. Relevance of thyroiditis and of other autoimmune diseases in children with vitiligo. *Dermatology* 2005;210:26-30.
- Narita T, Oiso N, Fukai K, Kabashima K, Kawada A, Suzuki T. Generalized vitiligo and associated autoimmune diseases in Japanese patients and their families. *Allergol Int*.

- 2011;60:505-8.
17. Handa S, Kaur I. Vitiligo; Clinical findings in 1436 patients. *J Dermatol*. 1999;26:653-7.
  18. Vijayasingam SM, Thai AC, Chan HL. Non-infective skin associations of diabetes mellitus. *Ann Acad Med Singapore*. 1988;17:526-35.
  19. Mahajan S, Koranne RV, Sharma SK. Cutaneous manifestation of diabetes mellitus. *Indian J Dermatol Venereol Leprol*. 2003;69:105-8.
  20. Hammam MA, Yasien HA, Algharably AF. Effect of Vitiligo Area Scoring Index on the quality of life in patients with vitiligo. *Menoufia Med J* 2019;32:244-9.