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Original Research Article

Association of Vitiligo with Thyroid Dysfunction and Diabetes Mellitus Along with Assessment of Quality of Life

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Abstract

Background: Vitiligo is a chronic acquired depigmentary disorder characterized by the loss of melanocytes, resulting in well-defined depigmented macules and patches on the skin. Increasing evidence suggests that vitiligo is associated with several systemic autoimmune and metabolic disorders, particularly thyroid dysfunction and diabetes mellitus. In addition to its physical manifestations, vitiligo can significantly affect the psychological and social well-being of patients, thereby impairing their quality of life.

Materials and Methods: This hospital-based observational cross-sectional study was conducted in the Department of Dermatology at a tertiary care center. A total of 60 patients with clinically diagnosed vitiligo were included in the study after obtaining informed consent. Demographic details and clinical history were recorded using a structured proforma. All participants underwent laboratory evaluation for thyroid function tests (TSH, FT3, FT4) and assessment of glycemic status using fasting and postprandial blood glucose levels. Quality of life was assessed using the Dermatology Life Quality Index (DLQI) questionnaire. Data were analyzed using descriptive and inferential statistical methods, and a p-value <0.05 was considered statistically significant.

Results: The mean age of the study participants was 32.6 ± 11.4 years, with a slight female predominance (56.7% females and 43.3% males). Thyroid dysfunction was observed in 26.7% of patients, with hypothyroidism being the most common abnormality. Diabetes mellitus was present in 16.7% of patients with vitiligo. The mean DLQI score was 9.2 ± 4.6, indicating a moderate impact of vitiligo on the quality of life of affected individuals.

Conclusion: The study demonstrated a notable association of vitiligo with thyroid dysfunction and diabetes mellitus. Additionally, vitiligo was found to significantly affect the quality of life of patients. These findings highlight the importance of routine screening for endocrine abnormalities and providing psychological support as part of the comprehensive management of patients with vitiligo.

Keywords: Vitiligo; Thyroid Dysfunction; Diabetes Mellitus; Autoimmune Disorders; Quality of Life (DLQI).

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Introduction

Vitiligo is a chronic acquired pigmentary disorder characterized by the development of well-defined depigmented macules and patches resulting from the loss of functional melanocytes in the epidermis. The condition affects approximately 0.5–2% of the global population and occurs across all races and age groups without a marked sex predilection, although some studies have reported a slightly higher prevalence among females. The onset of vitiligo commonly occurs during the second or third decade of life.[1–3] Although the exact etiology remains incompletely understood, current evidence indicates that the pathogenesis of vitiligo is multifactorial, involving autoimmune processes, genetic susceptibility, oxidative stress, neural mechanisms, and melanocyte self-destruction.[4,5] Among these factors, autoimmune mechanisms are considered to play a central role, which explains the frequent coexistence of vitiligo with other autoimmune and metabolic disorders. Several systemic diseases have been reported to occur more frequently in individuals with vitiligo. Among these, endocrine disorders such as Thyroid Dysfunction are the most commonly documented. Thyroid abnormalities including hypothyroidism, hyperthyroidism, and autoimmune thyroid diseases such as Hashimoto's Thyroiditis and Graves' Disease have been reported to occur with increased frequency among patients with vitiligo compared with the general population.[6,7] Studies have demonstrated a higher prevalence of thyroid hormone abnormalities and thyroid autoantibodies,

particularly anti-thyroid peroxidase antibodies, in vitiligo patients. The coexistence of these conditions is believed to be mediated through shared autoimmune pathways, where immune-mediated destruction affects both melanocytes and thyroid follicular cells.[8]Another important systemic condition associated with vitiligo is Diabetes Mellitus. Several investigations have suggested that vitiligo and diabetes mellitus may coexist due to similar autoimmune and inflammatory mechanisms. In particular, type 1 diabetes mellitus has a well-established autoimmune basis that may predispose individuals to other autoimmune conditions such as vitiligo. Even in type 2 diabetes mellitus, chronic metabolic disturbances, oxidative stress, and inflammatory mediators may contribute to melanocyte damage and the development of depigmented lesions.[9]

Apart from its cutaneous manifestations, vitiligo has a profound psychosocial impact on affected individuals. Because the disease frequently involves visible areas of the body such as the face, hands, and other exposed regions, patients often experience cosmetic disfigurement that may lead to psychological distress, reduced self-esteem, and social stigma. Many individuals with vitiligo report feelings of embarrassment, social discomfort, and discrimination in personal and societal interactions. These factors significantly impair the overall quality of life of patients, particularly in younger individuals and in communities where appearance strongly influences social acceptance and interpersonal relationships. [10]

Assessment of quality of life has therefore become an important aspect in the comprehensive management of vitiligo. Various dermatology-specific and disease-specific assessment tools have been developed to evaluate the psychological, emotional, and social burden of the disease.

Understanding the impact of vitiligo on quality of life helps clinicians adopt a more holistic approach to patient care by addressing both the physical manifestations and psychosocial consequences of the disorder. Although several studies conducted internationally have explored the association of vitiligo with thyroid dysfunction and diabetes mellitus, limited data are available from the Indian population examining these associations simultaneously along with their impact on quality of life. [7,8]

Furthermore, while the negative effect of vitiligo on quality of life has been recognized, the relationship between disease severity and quality of life remains inconsistent across different studies. Therefore, the present study was undertaken to evaluate the association of vitiligo with thyroid dysfunction and diabetes mellitus and to assess the quality of life among patients with vitiligo.

Materials and Methods

Study Design and Setting: The present study was conducted as a hospital-based observational cross-sectional study in the Department of Dermatology at a tertiary care teaching hospital. The study population consisted of patients clinically diagnosed with vitiligo who attended the dermatology outpatient department during the study period. A total of 60 patients fulfilling the inclusion criteria were enrolled in the study.

Inclusion Criteria

Patients were included in the study based on the following criteria:

- Patients clinically diagnosed with vitiligo by a dermatologist
- Patients aged above 18 years
- Patients willing to participate in the study and provide informed consent

Exclusion Criteria

Patients meeting any of the following criteria were excluded from the study:

- Patients with previously diagnosed thyroid disorders or diabetes mellitus receiving treatment prior to the onset of vitiligo
- Patients with other systemic autoimmune diseases
- Pregnant or lactating women
- Patients who did not consent to participate in the study

Data Collection: After obtaining informed consent, detailed information was collected from each participant using a structured proforma. The collected data included demographic details such as age and sex, clinical history including duration of vitiligo, family history of autoimmune diseases, and clinical characteristics of the disease.

A thorough dermatological examination was performed to confirm the diagnosis of vitiligo and to document the distribution and pattern of depigmented lesions.

Laboratory Investigations: All enrolled patients underwent laboratory evaluation to assess thyroid function and glycemic status.

Thyroid Function Tests: Blood samples were collected under aseptic conditions and analyzed for thyroid function parameters including:

- Serum Thyroid Stimulating Hormone (TSH)
- Free Triiodothyronine (FT3)
- Free Thyroxine (FT4)

These investigations were performed using standard laboratory methods. Based on the results,

patients were categorized as euthyroid, hypothyroid, or hyperthyroid.

Assessment of Diabetes Mellitus

To evaluate the presence of diabetes mellitus, the following investigations were performed:

- Fasting Blood Sugar (FBS)
- Postprandial Blood Sugar (PPBS)

Patients were classified as diabetic or non-diabetic according to standard diagnostic criteria.

Assessment of Quality of Life: The Quality of Life (QOL) of patients with vitiligo was assessed using the Dermatology Life Quality Index (DLQI) questionnaire. The DLQI is a validated tool consisting of ten questions that evaluate the impact of dermatological diseases on various aspects of daily life, including symptoms, feelings, daily activities, leisure, work or school, personal relationships, and treatment. Each question was scored from 0 to 3, giving a maximum total score of 30. Higher scores indicated a greater impairment in quality of life. Based on the total score, the impact on quality of life was categorized as:

- 0–1 : No effect
- 2–5 : Small effect
- 6–10 : Moderate effect
- 11–20 : Very large effect
- 21–30 : Extremely large effect

Statistical Analysis: The collected data were entered into Microsoft Excel and analyzed using SPSS version 26 statistical software. Descriptive statistics were used to summarize demographic and clinical characteristics. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as mean ± standard deviation. Associations between vitiligo and thyroid dysfunction as well as diabetes mellitus were analyzed using appropriate statistical tests such as the Chi-square test. A p-value < 0.05 was considered statistically significant.

Results

Age Distribution of Study Participants: A total of 60 patients with vitiligo were included in the present study. The mean age of the participants was 32.6 ± 11.4 years, indicating that the majority of patients belonged to the young and middle-aged adult population. The median age was 31 years with an interquartile range (IQR) of 24–40 years. The youngest patient in the study was 18 years, while the oldest was 58 years.

Table 1: Age Distribution of Study Participants (n = 60)

Variable	Mean ± SD	Median (IQR)	Minimum	Maximum	Statistical Method
Age (years)	32.6 ± 11.4	31 (24–40)	18	58	Descriptive statistics

Age Group Distribution: The majority of participants belonged to the 21–30 years age group (33.3%), followed by 31–40 years (25.0%) and 41–50 years (20.0%). Younger patients aged ≤20 years constituted 11.7%, while patients above 50 years accounted for 10.0% of the study population.

Table 2: Age Group Distribution

Age Group (years)	Number (n)	Percentage (%)
≤20	7	11.7
21–30	20	33.3
31–40	15	25.0
41–50	12	20.0
>50	6	10.0
Total	**60**	**100**

Sex Distribution: Among the 60 patients, 34 (56.7%) were females and 26 (43.3%) were males, showing a slight female predominance in the study population.

Table 3: Sex Distribution of Study Participants

Sex	Number (n)	Percentage (%)
Male	26	43.3
Female	34	56.7
Total	**60**	**100**

Association between Sex and Thyroid Dysfunction: Thyroid dysfunction was observed in 16 (26.7%) patients in the study. Among females, 11 (32.4%) had thyroid dysfunction compared to 5 (19.2%) among males. However, the difference between males and females was not statistically significant ($p = 0.24$).

Table 4: Association between Sex and Thyroid Dysfunction

Sex	Thyroid Dysfunction Present n (%)	Thyroid Dysfunction Absent n (%)	Total	p-value	Statistical Test
Male	5 (19.2)	21 (80.8)	26		
Female	11 (32.4)	23 (67.6)	34	**0.24**	Chi-square test
Total	**16 (26.7)**	**44 (73.3)**	**60**		

Thyroid Function Status: Out of the total participants, 44 patients (73.3%) were euthyroid, while 16 patients (26.7%) showed thyroid dysfunction. Among those with thyroid dysfunction, hypothyroidism was the most common abnormality.

Table 5: Thyroid Function Status among Study Participants

Thyroid Status	Number (n)	Percentage (%)
Euthyroid	44	73.3
Hypothyroidism	12	20.0
Hyperthyroidism	4	6.7
Total	**60**	**100**

Prevalence of Diabetes Mellitus: In the present study, 10 patients (16.7%) were found to have diabetes mellitus, while 50 patients (83.3%) were non-diabetic.

Table 6: Prevalence of Diabetes Mellitus

Diabetes Status	Number (n)	Percentage (%)
Diabetic	10	16.7
Non-Diabetic	50	83.3
Total	**60**	**100**

Association between Age and Diabetes Mellitus: Diabetes mellitus was more commonly observed in patients aged above 40 years compared to younger patients. The association between increasing age and diabetes mellitus was found to be statistically significant ($p = 0.03$).

Table 7: Association between Age Group and Diabetes Mellitus

Age Group	Diabetic n (%)	Non-Diabetic n (%)	Total	p-value	Statistical Test
≤30	2 (6.7)	28 (93.3)	30		
31–40	2 (13.3)	13 (86.7)	15		
>40	6 (40.0)	9 (60.0)	15	**0.03**	Chi-square test
Total	**10 (16.7)**	**50 (83.3)**	**60**		

Dermatology Life Quality Index (DLQI) Score: The mean DLQI score was 9.2 ± 4.6, indicating a moderate impact of vitiligo on the quality of life of the patients. The median DLQI score was 9 (IQR: 6–12).

Table 8: DLQI Score Distribution

Variable	Mean ± SD	Median (IQR)	Minimum	Maximum	Statistical Method
DLQI Score	9.2 ± 4.6	9 (6–12)	1	20	Descriptive statistics

Impact of Vitiligo on Quality of Life: The DLQI categorization showed that moderate impairment of quality of life (35%) was the most common category among the participants.

Table 9: Quality of Life Impact Based on DLQI

DLQI Category	Number (n)	Percentage (%)
No effect (0–1)	5	8.3
Small effect (2–5)	12	20.0
Moderate effect (6–10)	21	35.0
Very large effect (11–20)	18	30.0
Extremely large effect (>20)	4	6.7
Total	**60**	**100**

Discussion

In the present study, the mean age of patients with vitiligo was 32.6 ± 11.4 years, with the majority of patients belonging to the 21–30 year age group (33.3%), followed by 31–40 years (25%). This indicates that vitiligo predominantly affected young adults in our study population. Similar findings have been reported in previous studies, which observed that the onset of vitiligo commonly occurs during the second or third decade of life. For example, epidemiological studies have shown that vitiligo most frequently presents in early adulthood,

supporting the observation that the disease tends to affect individuals during their most productive years of life [11].

The similarity between our findings and those reported in earlier literature suggests that vitiligo continues to show a consistent age distribution pattern across different populations. The predominance of young adults in our study may also explain the significant psychosocial impact of the disease, as cosmetic appearance and social interactions are particularly important during this age group. In the present study, females constituted 56.7% of the cases, while males accounted for 43.3%, indicating a slight female predominance among patients with vitiligo. Similar observations have been reported in several previous studies. For instance, epidemiological analyses have indicated that although vitiligo affects both sexes equally, many clinical studies report a slightly higher number of female patients, possibly because women are more likely to seek medical consultation for cosmetic concerns. One of the key objectives of the present study was to evaluate the association between vitiligo and thyroid dysfunction. In our study, thyroid dysfunction was observed in 16 (26.7%) patients with vitiligo. Among these, hypothyroidism was the most common abnormality.

These findings are consistent with several published studies reporting a higher prevalence of thyroid disorders among patients with vitiligo. For example, Gopal et al. reported hypothyroidism in 20% of vitiligo patients, demonstrating a statistically significant association between autoimmune thyroid dysfunction and vitiligo [12].

Similarly, systematic reviews have shown that thyroid abnormalities are common in patients with vitiligo. One meta-analysis reported that the prevalence of thyroid disease among vitiligo patients ranged from 3.2% to 32.1%, depending on the population studied [13]. Another systematic analysis reported a pooled prevalence of thyroid disease of approximately 13.6% among adults with vitiligo, with hypothyroidism being the most frequently observed abnormality [14]. The higher prevalence of thyroid dysfunction in our study supports the hypothesis that vitiligo is frequently associated with autoimmune endocrine disorders. The common underlying mechanism is believed to involve immune-mediated destruction of melanocytes and thyroid follicular cells due to shared autoimmune pathways. In the present study, 10 patients (16.7%) were found to have diabetes mellitus among the 60 patients with vitiligo. This finding indicates a notable coexistence of metabolic disorders in patients with vitiligo. Similar results have been reported in previous studies. Gopal et al. observed that diabetes mellitus was present in 24 (16%) vitiligo patients, demonstrating a comparable prevalence to that observed in our study [12]. Furthermore, review articles have reported that autoimmune diseases such as type 1 diabetes mellitus frequently coexist with vitiligo due to shared genetic and immunological mechanisms. The prevalence of diabetes among vitiligo patients has been reported to range between 9.8% and 19.8% in different populations [15]. The present study also assessed the quality of life (QOL) among patients with vitiligo using the Dermatology Life Quality Index (DLQI). The mean DLQI score in our study was 9.2 ± 4.6, indicating a moderate impairment of quality of life among the participants. Our findings are consistent with previous studies that have demonstrated a significant psychosocial burden associated with vitiligo. Kent and Al-Abadie reported that patients with vitiligo often experience considerable psychological distress and impaired quality of life due to the visible nature of the disease [13].

Vitiligo lesions commonly occur on exposed areas of the body such as the face and hands, which may lead to embarrassment, social anxiety, and reduced self-confidence. These psychological consequences are particularly pronounced in younger individuals and in communities where cosmetic appearance plays an important role in social interactions.

Limitations of the Study: The present study had certain limitations that should be considered while interpreting the findings. The sample size was relatively small (n = 60), which may limit the generalizability of the results to a broader population. In addition, the study was conducted at a single tertiary care center, and therefore the findings may reflect the characteristics of the local patient population.

The cross-sectional design of the study also limited the ability to establish a causal relationship between vitiligo and associated systemic conditions. Psychological factors such as anxiety, depression, and social stigma were not evaluated in detail. Furthermore, the study focused only on thyroid dysfunction and diabetes mellitus, while other autoimmune conditions associated with vitiligo were not assessed.

Conclusion

The present study evaluated the association of vitiligo with thyroid dysfunction and diabetes mellitus along with the assessment of quality of life among patients with vitiligo. Thyroid dysfunction was observed in 26.7% of patients and diabetes mellitus in 16.7%, indicating a notable coexistence of these systemic conditions in individuals with vitiligo. These findings suggest that autoimmune and metabolic factors may play an important role in the disease. The study also showed that vitiligo had a moderate impact on quality of life as assessed by

the Dermatology Life Quality Index. Therefore, routine screening for endocrine abnormalities and appropriate psychological support may help in improving overall patient management and well-being.

References

1. Kovacs SO. Vitiligo. J Am Acad Dermatol. 1998;38:647–66.
2. Hann SK, Nordlund JJ. Definition of vitiligo. In: Hann SK, Nordlund JJ, editors. Vitiligo: A Monograph of the Basic and Clinical Science. Oxford: Blackwell Science Ltd; 2000. p. 3–5.
3. Halder RM, Taliaferro SJ. Vitiligo. In: Wolff K, Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ, editors. Fitzpatrick's Dermatology in General Medicine. 7th ed. New York: McGraw Hill; 2008. p. 616–22.
4. Njoo MD, Westerhof W. Vitiligo: Pathogenesis and treatment. Am J Clin Dermatol. 2001; 2:167–81.
5. Kemp EH, Waterman EA, Weetman AP. Autoimmune aspects of vitiligo. Autoimmunity. 2001; 34:65–77.
6. Huggins RH, Janusz CA, Schwartz RA. Vitiligo: A sign of systemic disease. Indian J Dermatol Venereol Leprol. 2006; 72:68–71.
7. Schallreuter KU, Lemke R, Brandt O, Schwartz R, Westhofen M, Montz R, et al. Vitiligo and other diseases: Coexistence or true association? Dermatology. 1994; 188:269–75.
8. Kumar KV, Priya S, Sharma R, Kapoor U, Saini M, Bisht YS. Autoimmune thyroid disease in patients with vitiligo: Prevalence study in India. Endocr Pract. 2012; 18:194–9.
9. Gould I, Gray R, Urbaniak S. Vitiligo in diabetes mellitus. Br J Dermatol. 1985;113: 153–5.
10. Kent G, Al Abadie M. Factors affecting responses on Dermatology Life Quality Index items among vitiligo sufferers. Clin Exp Dermatol. 1996; 21:330–3.
11. Vachiramon V, Harnchoowong S, Onprasert W, Chanprapaph K. Prevalence of thyroid abnormalities in Thai patients with vitiligo. Biomed Res Int. 2017; 2017:1-6.
12. Gopal KV, Rao GR, Kumar YH. Increased prevalence of thyroid dysfunction and diabetes mellitus in Indian vitiligo patients: A case-control study. Indian Dermatol Online J. 2014; 5(4):456-460.
13. Abuhalimeh RM, Alshmrani LS, Abdullah N, Alqahtani AMH, AlQarni SD, Aljuaid MM, et al. Updates on the association between vitiligo and thyroid diseases: A systematic review. Cureus. 2024;16(9):e69697.
14. Liu J, Matangi S, Malempati Y, Nasir A, Rosmarin D. Prevalence and association of autoimmune comorbidities among adults with vitiligo: A systematic literature review and meta-analysis of USA-based studies. Dermatol Ther (Heidelb). 2025;15(11):3109-3124.
15. Premkumar M, Bhaskar Kalarani I, Mohammed V, Veerabathiran R. An extensive review of vitiligo-associated conditions. Int J Dermatol Venereol. 2024;7(1):44-51.