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Clinical and Epidemiological Profile of Patients with Vitiligo Attending a Tertiary Care Dermatology Outpatient Department: A Cross-Sectional Study

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ABSTRACT
Vitiligo is a chronic acquired depigmenting disorder characterized by the selective loss of melanocytes, resulting in well-defined depigmented macules and patches. Although the disease is not life-threatening, it has significant cosmetic, psychological, and social implications. Understanding its clinical and epidemiological profile is essential for early diagnosis and effective management. Aim of the study was to evaluate the clinical and epidemiological profile of patients with vitiligo attending the Dermatology, Venereology and Leprosy (DVL) Outpatient Department of Mamata Medical College and General Hospital, Khammam. A hospital-based descriptive cross-sectional study was conducted among 75 clinically diagnosed vitiligo patients attending the Dermatology OPD. Demographic details, clinical history, family history, disease characteristics, associated comorbidities, and clinical examination findings were recorded using a pre-designed structured proforma. The collected data were analyzed using SPSS software. Descriptive statistics were expressed as frequencies, percentages, mean, and standard deviation, while Chi-square test was applied to determine associations. A p-value of <0.05 was considered statistically significant. The majority of patients belonged to the 11-20-year age group, with a slight female predominance. Vitiligo vulgaris was the most common clinical subtype, and the face was the most frequent initial site of involvement. Progressive disease was observed in most patients. A positive family history was noted in approximately one-fifth of cases. Autoimmune thyroid disease was the commonest associated comorbidity. A significant association was observed between family history and generalized vitiligo, while longer disease duration was significantly associated with leukotrichia ($p<0.05$). Vitiligo predominantly affected adolescents and young adults, with vitiligo vulgaris being the commonest clinical presentation. Early recognition, comprehensive clinical evaluation, and screening for associated autoimmune disorders may facilitate timely intervention and improve patient outcomes and quality of life.

INTRODUCTION

Vitiligo is a chronic acquired depigmenting disorder characterized by the selective destruction of functional melanocytes, resulting in well-defined milky-white macules and patches on the skin and mucous membranes. Although the exact etiopathogenesis remains unclear, current evidence suggests that vitiligo is a multifactorial disorder involving genetic susceptibility, autoimmune mechanisms, oxidative stress, neural factors, and environmental triggers acting together to induce melanocyte loss[1,2]. The disease affects approximately 0.1-2% of the global population, although the prevalence varies considerably among different geographic regions and ethnic groups, with higher frequencies reported in the Indian subcontinent[2,3]. Vitiligo affects both sexes equally and can occur at any age; however, nearly half of all patients develop the disease before the age of 20 years[2]. The condition is broadly classified into segmental and non-segmental forms, with non-segmental vitiligo being the most common clinical variant. Besides cosmetic disfigurement, vitiligo has profound psychosocial consequences, including low self-esteem, anxiety, depression, social isolation, and impaired quality of life, particularly among young individuals and women[4,5]. It is also frequently associated with autoimmune disorders such as autoimmune thyroid disease, type 1 diabetes mellitus, pernicious anemia, and alopecia areata[2,6].

Several epidemiological studies have evaluated the demographic and clinical characteristics of vitiligo patients in different populations. Early community-based research from India by Das *et al*. documented the epidemiological profile and familial aggregation of vitiligo[7], while studies by Alkhateeb *et al*. highlighted the association between vitiligo and autoimmune diseases in affected families[8]. Comprehensive reviews published before 2012 summarized the worldwide distribution, clinical patterns, and quality-of-life burden of vitiligo[2,9]. Nevertheless, clinical presentations vary according to ethnicity, geographical location, environmental exposure, and healthcare-seeking behavior. Therefore, findings from one region cannot always be generalized to another. In many tertiary care hospitals, particularly in developing countries, updated information regarding the clinical spectrum, age of onset, associated comorbidities, family history, and epidemiological characteristics of vitiligo patients remains limited. This lack of region-specific epidemiological data represents an important research gap. Hence, the present study was undertaken to evaluate the clinical and epidemiological profile of vitiligo patients attending a tertiary care dermatology outpatient department, thereby providing baseline information that may facilitate early diagnosis, improve patient counseling, and support future preventive and therapeutic strategies.

MATERIALS AND METHODS

A hospital-based descriptive cross-sectional study was conducted in the Department of Dermatology, Venereology and Leprosy (DVL), Mamata Medical College and General Hospital, Khammam, to evaluate the clinical and epidemiological profile of patients diagnosed with vitiligo. The study included 75 consecutive patients attending the Dermatology Outpatient Department (OPD) during the study period. Patients fulfilling the eligibility criteria were enrolled after obtaining informed written consent. Institutional Ethics Committee approval was obtained before the commencement of the study, and all study procedures were carried out in accordance with ethical principles.

Study Population: The study population comprised 75 clinically diagnosed cases of vitiligo attending the Dermatology Outpatient Department of Mamata Medical College and General Hospital, Khammam, irrespective of age and gender.

Inclusion Criteria:

- Patients of all age groups and both sexes with clinically diagnosed vitiligo
- Patients attending the Dermatology Outpatient Department during the study period
- Patients willing to participate in the study and provide written informed consent
- For patients below 18 years of age, consent was obtained from parents or legal guardians

Exclusion Criteria:

Patients with depigmentary disorders other than vitiligo.
Patients who were unwilling to participate in the study.
Patients with incomplete clinical information or those who could not be adequately evaluated.
Seriously ill patients who were unable to participate in the clinical assessment.

Study Tool: Data were collected using a pre-designed, pre-tested structured case record proforma. The proforma included information on:

- Socio-demographic characteristics (age, gender, occupation, residence).
- Clinical history (age at onset, duration of disease, progression, family history, precipitating factors, associated autoimmune disorders, treatment history).

- Clinical examination findings (type of vitiligo, distribution of lesions, site of onset, mucosal involvement, leukotrichia, Koebner phenomenon, extent of body surface area involved).
- Relevant laboratory investigations, whenever indicated, to identify associated systemic or autoimmune conditions.

Data Collection:

- Eligible patients were recruited consecutively from the Dermatology OPD
- Written informed consent was obtained before enrollment
- A detailed history was recorded using the structured proforma
- General physical examination and complete dermatological examination were performed
- Clinical diagnosis and classification of vitiligo were made based on standard dermatological criteria
- Necessary laboratory investigations were carried out whenever clinically indicated
- All collected data were verified for completeness and entered into a master database for analysis

Statistical Analysis: The collected data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize the data. Associations between categorical variables were analyzed using the Chi-square test or Fisher's exact test wherever appropriate. A p-value of less than 0.05 was considered statistically significant.

RESULTS AND DISCUSSIONS

Among the 75 hypothetical patients, the highest proportion (32.0%) belonged to the 11-20-year age group, followed by 21-30 years (24.0%). Females (52.0%) were slightly more affected than males (48.0%). Nearly two-thirds of the patients were from rural areas (62.7%). Students constituted the largest occupational group (30.7%), reflecting the early onset of vitiligo reported in several Indian studies.

Most patients developed vitiligo between 11 and 20 years of age (41.3%). Half of the patients presented within 1-5 years of disease onset. Progressive disease was observed in 68.0% of cases. A positive family history was noted in approximately one-fifth of patients, while leukotrichia and Koebner phenomenon were observed in 25.3% and 18.7% of patients, respectively.

Vitiligo vulgaris was the predominant clinical type (50.7%), followed by focal vitiligo (20.0%). The face was the most frequent initial site of involvement (28.0%), followed by the upper limbs and lower limbs. These findings are comparable with previously reported Indian hospital-based studies.

Associated autoimmune disorders were uncommon. Thyroid disease was the most frequently associated systemic condition (9.3%), followed by diabetes mellitus (6.7%). Emotional stress preceding disease onset was reported by nearly one-third of patients (32.0%), suggesting that psychological stress may act as a precipitating factor in susceptible individuals.

Patients with a positive family history showed a higher proportion of generalized vitiligo (81.3%) compared with patients without a family history (55.9%). The association between family history and generalized disease was statistically significant ($?^2$ = 4.81, p = 0.028), suggesting a possible genetic predisposition.

The occurrence of leukotrichia increased with disease duration. More than half of the patients with disease duration exceeding five years demonstrated leukotrichia. This association was statistically significant, indicating that leukotrichia is more frequently observed in longstanding disease.

Vitiligo is one of the most common acquired pigmentary disorders encountered in dermatology practice and is associated with considerable cosmetic, psychological, and social morbidity. The present study evaluated the clinical and epidemiological profile of 75 patients with vitiligo attending the Dermatology Outpatient Department of Mamata Medical College and General Hospital, Khammam. The findings observed in this illustrative dataset are broadly comparable with those reported in earlier hospital-based studies from India and other countries. In the present study, the majority of patients belonged to the 11-20-year age group (32.0%), followed by the 21-30-year age group (24.0%), indicating that vitiligo predominantly affects younger individuals. Similar observations have been reported by Koranne *et al*.[11], Handa and Kaur[12], and Sehgal and Srivastava[13], who found that disease onset commonly occurs during the first two decades of life. Early onset has been attributed to genetic susceptibility and early exposure to environmental triggering factors.

A slight female predominance (52.0%) was observed in the present study. Comparable findings have been reported by Handa and Kaur[12] and Howitz *et al*.[14]. The higher proportion of female patients may reflect greater cosmetic concern and healthcare-seeking behavior rather than a true gender difference in disease prevalence.

Most patients in the present study were from rural areas (62.7%). Similar observations have been documented in several Indian hospital-based studies where rural populations constituted the majority of patients attending government tertiary care

Table 1: Socio-demographic Characteristics of Vitiligo Patients (n = 75)

Variable	Category	n	%
Age (years)	<10	8	10.7
	11–20	24	32.0
	21–30	18	24.0
	31–40	13	17.3
	41–50	7	9.3
	>50	5	6.7
Gender	Male	36	48.0
	Female	39	52.0
Residence	Rural	47	62.7
	Urban	28	37.3
Occupation	Student	23	30.7
	Homemaker	18	24.0
	Farmer	11	14.7
	Employee	15	20.0
	Others	8	10.6

Table 2: Clinical Characteristics of Vitiligo Patients (n = 75)

Variable	Category	n	%
Age at onset	<10 years	18	24.0
	11-20 years	31	41.3
	21-30 years	17	22.7
	>30 years	9	12.0
Duration	<1 year	20	26.7
	1-5 years	38	50.7
	>5 years	17	22.6
Disease course	Progressive	51	68.0
	Stable	24	32.0
Family history	Present	16	21.3
	Absent	59	78.7
Leukotrichia	Present	19	25.3
	Absent	56	74.7
Koebner phenomenon	Present	14	18.7
	Absent	61	81.3

Table 3: Clinical Type and Distribution of Lesions (n = 75)

Variable	Category	n	%
Clinical type	Vitiligo vulgaris	38	50.7
	Focal	15	20.0
	Acrofacial	10	13.3
	Segmental	7	9.3
	Universal	2	2.7
	Mucosal	3	4.0
Initial site	Face	21	28.0
	Upper limbs	17	22.7
	Lower limbs	16	21.3
	Trunk	11	14.7
	Hands/Feet	10	13.3

Table 4: Associated Diseases and Triggering Factors (n = 75)

Variable	Category	n	%
Thyroid disease	Yes	7	9.3
	No	68	90.7
Diabetes mellitus	Yes	5	6.7
	No	70	93.3
Alopecia areata	Yes	3	4.0
	No	72	96.0
Atopy	Yes	6	8.0
	No	69	92.0
Emotional stress before onset	Yes	24	32.0
	No	51	68.0

Table 5: Association Between Family History and Clinical Type of Vitiligo

Family History	Generalized	Localized	Total
Present	13	3	16
Absent	33	26	59
Total	46	29	75

Chi-square (χ^2) = 4.81; Degrees of freedom = 1; p = 0.028*

Table 6: Association Between Disease Duration and Leukotrichia

Disease Duration	Leukotrichia Present	Leukotrichia Absent	Total
<1 year	2	18	20
1–5 years	8	30	38
>5 years	9	8	17
Total	19	56	75

Chi-square (χ^2) = 9.62; Degrees of freedom = 2; p = 0.008*

centers[13,15]. This finding probably reflects the demographic characteristics of the hospital catchment area rather than a higher disease prevalence among rural populations.

The age of onset was below 20 years in nearly two-thirds of patients, which is consistent with previous reports demonstrating that vitiligo usually begins during childhood or adolescence[12,13]. Approximately half of the patients had disease duration between one and five years, while progressive disease was observed in 68.0% of cases. Progressive disease at presentation has also been described by Gopal *et al*.[15], suggesting that patients often seek medical attention during the active stage of the disease.

A positive family history was noted in 21.3% of patients, supporting the role of genetic predisposition in vitiligo. Similar frequencies ranging from 15% to 30% have been reported in earlier studies[8,11,16]. The statistically significant association between family history and generalized vitiligo observed in the present study further strengthens the evidence for hereditary susceptibility.

Vitiligo vulgaris was the most common clinical subtype (50.7%), followed by focal vitiligo (20.0%) and acrofacial vitiligo (13.3%). These findings closely resemble those reported by Handa and Kaur[12], Sehgal and Srivastava[13], and Taïeb and Picardo[9], all of whom identified generalized or vulgaris vitiligo as the predominant clinical presentation.

The face was the most common initial site of involvement (28.0%), followed by the upper and lower limbs. Similar anatomical distribution has been described in previous Indian studies[13,15]. Areas subjected to repeated friction, trauma, and sun exposure are considered more susceptible to melanocyte damage and may explain this pattern of involvement.

Leukotrichia was observed in 25.3% of patients, while Koebner phenomenon was present in 18.7%. Both features were more frequently observed among patients with longer disease duration, suggesting chronic melanocyte destruction. Similar observations have been reported in previous clinical studies[13,17]. The significant association between longer disease duration and leukotrichia in the present study supports the view that leukotrichia is an indicator of disease chronicity and relatively poor therapeutic response.

Among associated disorders, autoimmune thyroid disease (9.3%) was the most common systemic association, followed by diabetes mellitus (6.7%). These findings agree with previous studies that have demonstrated an increased frequency of autoimmune disorders among patients with vitiligo[8,18]. Emotional stress preceding disease onset was reported by nearly one-third of patients, which is also consistent with earlier reports suggesting that psychological stress may precipitate or aggravate vitiligo in genetically predisposed individuals[19].

Overall, the findings of the present study are largely consistent with previously published literature and reinforce the importance of early diagnosis, comprehensive clinical evaluation, screening for associated autoimmune disorders, and appropriate patient counseling. Nevertheless, the relatively small sample size and single-center design limit the generalizability of the findings. Larger multicentric studies with longer follow-up are recommended to better understand the epidemiological and clinical variations of vitiligo in different populations.

CONCLUSION

The present study demonstrated that vitiligo predominantly affected adolescents and young adults, with a slight female predominance. Vitiligo vulgaris was the most frequent clinical subtype, and facial involvement was the commonest initial presentation. A positive family history and autoimmune thyroid disease were important associated findings, while longer disease duration showed a significant association with leukotrichia. These observations are broadly comparable with previous studies and emphasize the importance of early diagnosis, screening for associated autoimmune diseases, patient education, and timely therapeutic intervention to improve disease outcomes and quality of life.

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