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Vitiligo: Clinical and Laboratory Characteristics in 573 Saudi Patients.

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Background: Vitiligo is a common disease. Limited studies in Saudi Arabia have explored the detailed clinical characteristics of vitiligo, as outlined in recent consensus reports by vitiligo experts.

Objective: To determine vitiligo prevalence and detailed clinical characteristics in a Saudi cohort.

Methods: Cross-sectional study over six years. All cases were electronically identified and manually verified. Prevalence and sex were determined based on all vitiligo cases. Detailed analysis was done only for patients seen in a specialized vitiligo clinic with standardized documentation.

Results: There were 1555 vitiligo cases (prevalence 0.235% [95% confidence interval 0.224–0.247], 938 [60.32%] were female). Detailed analysis for other variables was done in 573 patients. Onset before age 20 years was found in 49%. Family history of vitiligo was reported in 42.15%. Triggering factors were present in 32% with stress being the most common (24%). Proportion of clinical characteristics was as follows: nonsegmental vitiligo (88%), signs of activity (49%), lesional pruritus (25%), halo nevi (4%), leukotrichia (19%). Some patients had isolated facial involvement and others had leukotrichia on the eyelids (not eyelashes). Atopy and hypothyroidism were the most prevalent systemic diseases, while alopecia areata, atopic dermatitis, and psoriasis were the top skin conditions. Antithyroid antibodies were high in approximately a third of patients and the majority of patients had low vitamin D. Elevated erythrocyte sedimentation rate (ESR) was observed more in patients with clinical signs of activity (70% vs 54%, p-value 0.0007).

Conclusion: Prevalence of vitiligo was found to be similar to worldwide figures, with a higher proportion having affected family members. Stress as a trigger, lesional pruritus, signs of activity, thyroid disease, and low vitamin D were all common and should be routinely checked. Novel findings include isolated facial involvement, eyelid leukotrichia, and high ESR in active vitiligo.

Keywords: dermatology, vitiligo, melanocytes, depigmentation, Saudi, Arab, middle east

Introduction

Vitiligo is an autoimmune skin condition in which patients develop white skin patches. It is a common disease, affecting 0.5–2% individuals worldwide and has a major psychological impact on patients.[1,2] Such adverse psychological effect of vitiligo was recently described among Saudi patients.[3] Several negative psychological effects were reported in patients with vitiligo, including stigmatization, sleep disturbances, relationship difficulties, and avoidance behaviors. In general, vitiligo patients have a higher proportion of psychosocial comorbidities as compared to healthy people.[4] Therefore, understating different aspects of vitiligo is of great importance.

Vitiligo is a multifactorial disease that develops in the presence of genetic predisposition and environmental factors. More than 50 genetic loci have been identified in patients with vitiligo.[5] Furthermore, the significant effect of consanguinity and familial aggregation on the risk of developing vitiligo was recently shown.[6,7] Other components in the pathogenesis of vitiligo include autoimmunity, oxidative stress, melanocyte detachment (melanocytorrhagy), and neural factors.[8,9] Autoimmunity plays a major role in the pathogenesis of vitiligo. Depigmented patches manifest due to the eventual destruction of melanocytes by T cells. The initiation of this process appears to be from the innate immune

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system and oxidative stress acting as a bridge to the subsequent activation of T cells. CD8+ T cells are responsible for the final and direct destruction of melanocytes.[10]

Clinically, vitiligo has two main forms: nonsegmental vitiligo (NSV) and segmental vitiligo (SV). In NSV, lesions symmetrically affect both sides of the body with variable distribution and comprise the majority of vitiligo cases. SV is less common and characterized by unilateral linear patches.[11] Vitiligo is strongly associated with many cutaneous and systemic autoimmune conditions, especially thyroid disease.[12] Due to the major influence of genetic factors in vitiligo, research from different populations in the world might be important. Few studies in Saudi Arabia have explored the detailed clinical characteristics of vitiligo, as outlined in recent consensus reports by vitiligo experts. The aim of this work was to determine the prevalence together with detailed clinical and laboratory characteristics of vitiligo in a large center in central Saudi Arabia.

Methods

This was a retrospective cross-sectional study conducted at the Ministry of National Guard Health Affairs, Riyadh, Saudi Arabia. It was approved by the institutional ethics committee at King Abdullah International Medical Research Center (NRC21R/295/07). The requirement for informed consent was waived by the committee due to the retrospective design of the study. The study was conducted in accordance with the Declaration of Helsinki and all data were anonymized to ensure patient confidentiality. Medical records were electronically reviewed for the period from January 2016 to December 2021. The ICD-10 code for vitiligo (L80) was used to identify all cases. The clinical notes for each identified case were manually reviewed. Cases were excluded if: 1. Diagnosis was not made by a dermatologist. 2. The documented diagnosis was not vitiligo. 3. There was lack of sufficient clinical documentation supporting the diagnosis of vitiligo.

Prevalence, age at diagnosis, and sex were determined based on all patients with vitiligo seen during the study period. Detailed analysis was done only for patients seen in a specialized vitiligo clinic. Clinical documentation in the specialized vitiligo clinic follows a standardized format based on recently published criteria. Variables included demographic data, initial site affected by vitiligo, symptoms within lesional skin, triggering factors, vitiligo clinical characteristics (type, activity, halo nevus, leukotrichia), personal and family history of autoimmune diseases, and laboratory abnormalities. Early onset disease was defined as vitiligo developing before the age of 12 years.[13] Premature hair greying was defined as >50% of the hair becoming gray by age 35 years.[14]

The type of vitiligo was determined based on the Vitiligo European Task force (VETF) definitions.[11] Acrofacial vitiligo was considered if there was involvement of the face and distal extremities. Involvement of the distal extremities without face lesions was classified as acral vitiligo. If only the face was involved then this was labelled as facial vitiligo. Upper and lower extremities were defined as areas not including the hands and feet, respectively. Finger involvement was divided into two parts due to variation in hair distribution and different treatment response: 1. Distal phalanx was labelled as “periungual finger”. 2. Proximal part of the finger was labelled as “finger”. History-based vitiligo activity was documented using Vitiligo Disease Activity (VIDA) Score.[15] Four vitiligo signs of activity were recorded based on recent literature: hypochromic areas and/or borders, confetti-like depigmentation, Koebner phenomenon, and inflammatory vitiligo.[16,17] Leukotrichia was considered present if more than 30% of the affected area has white hair as this was thought to have more clinically relevant effect on treatment response.[14]

Statistical analysis was performed with JMP Pro statistical software version 17. Categorical variables were presented as frequencies and percentages. Numerical variables were presented as mean with standard deviation (SD) and median with interquartile range (IQR). Chi-square test was used to check the association between categorical variables. A p-value <0.05 was considered statistically significant.

Results

A total of 1555 patients with vitiligo were identified out of 660,395 patients seen in all outpatient clinics (dermatology and non-dermatology) during the study period. Accordingly, the prevalence of vitiligo was estimated to be 0.235% (95% confidence interval 0.224–0.247). Vitiligo accounted for 5.87% of all patients seen in dermatology clinics in the same period, with 938 (60.32%) being female (Table 1).

Table 1 Patient Demographics and Clinical Characteristics.[a]

Characteristic	n	%
Age at diagnosis, years (n = 1555)		
Mean (SD)	29.26 (17.47)	
Median (IQR)	27 (15, 42)	
Sex (n = 1555)		
Female	938	60.32%
Male	617	39.68%
Age of onset, years (n = 568)		
Mean (SD)	24.22 (16.16)	
Median (IQR)	20 (10, 35)	
0–12	161	28.35%
12–20	116	20.42%
20–30	101	17.78%
≥ 30	190	33.45%
Skin phototype (n = 549)		
3	409	74.50%
4	119	21.68%
5	21	3.83%
Family history of vitiligo (n = 548)	231	42.15%
Personal history of premature hair graying (n = 343)	15	4.37%
Family history of premature hair graying (n = 344)	45	13.08%
Body surface area (n = 571)		
0–5%	374	65.50%
5–10%	69	12.08%
10–20%	52	9.11%
≥ 20%	76	13.31%
Initial site affected with vitiligo (n = 523)		
Head and neck	205	39.20%
Eyelid	54	10.33%
Lip	8	1.53%
Trunk	51	9.75%
Upper extremity	53	10.13%
Lower extremity	104	19.89%
Hands	103	19.69%

(*Continued*)

Table 1 (Continued).

Characteristic	n	%
Feet	54	10.33%
Genital	14	2.68%
Associated lesional symptoms (n = 468)		
Pruritus	117	25.00%
During vitiligo	41	35.04%
Preceding vitiligo	61	52.14%
Both during and preceding vitiligo	15	12.82%
Pain and/or burning sensation	12	2.56%

Notes: [a]Age at diagnosis and sex were calculated from a total of 1555 patients. Detailed analysis of other characteristics was based on data from 573 patients (numbers do not match total number of patients due to missing values).
Abbreviations: IQR, Interquartile range; SD, Standard deviation.

Detailed analysis for other variables was based on data from 573 patients. Vitiligo developed before the age of 20 years in almost half of the patients with approximately 30% before the age of 12 years (Table 1). A family member with vitiligo was reported in 42.15%. Personal and family history of premature hair graying was positive in 4.37% and 13.08% of the patients, respectively. The affected body surface area was <5% in most patients. The head and neck were the most frequently reported initial sites for vitiligo and 25% of patients experienced associated lesional pruritus (more often occurring before the development of a vitiligo lesion).

Triggering factors were present in 32%, mostly coinciding with the onset of vitiligo (Table 2). Stress was the most common triggering factor, with extreme fear being the top stressor. Almost 90% of patients had NSV, with generalized vitiligo being the most prevalent overall (Table 3). The top five sites affected were the lower extremity, head and neck, feet, hands, and upper extremity (Figure 1). Approximately half of the patients had active vitiligo in the past 3 months with positive signs on examination. "Hypochromic areas and/or borders" was the most common sign followed by

Table 2 Vitiligo Triggering Factors (N = 484).[a]

Triggering factors	n	%
Trigger present	156	32.23%
At onset of vitiligo	125	25.83%
Exacerbate existing vitiligo	16	3.31%
Both	15	3.10%
Trigger not present	328	67.77%
Stress	115	23.76%
Extreme fear	22	19.13%
Death	18	15.65%
Family issues	13	11.30%
Other stress	62	53.91%

(*Continued*)

Table 2 (Continued).

Triggering factors	n	%
Motor vehicle accident	4	0.83%
Physical trauma	16	3.31%
Sunburn	4	0.83%
Skin inflammation	5	1.03%
Pregnancy	4	0.83%
Iatrogenic or medication-induced	10	2.07%
Topical medications	4	40.00%
TNF inhibitors	3	30.00%
Intravenous line	1	10.00%
Stem cell transplantation	2	20.00%
Infection	4	0.83%
Upper respiratory tract infection	1	25.00%
Coronavirus disease (COVID-19)	1	25.00%
Chickenpox	1	25.00%
Herpes simplex virus infection	1	25.00%
Change in diet for weight loss	1	0.21%

Notes: [a]Number does not match total number of patients (n = 573) due to missing values.
Abbreviation: TNF, Tumor necrosis factor alpha.

Table 3 Vitiligo Clinical Characteristics.[a]

Characteristic	n	%
Type of vitiligo (n = 573)[b]		
Nonsegmental	503	87.78%
Acral	65	11.34%
Acrofacial	92	16.06%
Acrofacial (including pure acral cases)	157	27.40%
Facial	13	2.27%
Generalized	293	51.13%
Mixed (nonsegmental with segmental)	8	1.40%
Universal	32	5.58%
Segmental	34	5.93%
Monosegmental	29	85.29%
Bisegmental	5	14.71%

(*Continued*)

Table 3 (Continued).

Characteristic	n	%
Undetermined vitiligo	36	6.28%
Focal	31	5.41%
Mucosal (one isolated site)	5	0.87%
VIDA score (n = 568)		
+4 (active in the past 6 weeks)	168	29.58%
+3 (active in the past 3 months)	105	18.49%
+2 (active in the past 6 months)	54	9.51%
+1 (active in the past 1 year)	26	4.58%
0 (stable for at least 1 year)	139	24.47%
−1 ((stable for at least 1 year with repigmentation)	76	13.38%
Signs of activity (n = 551)	269	48.82%
Hypochromic areas and/or borders	220	81.78%
Confetti-like depigmentation	158	58.74%
Koebner phenomenon	96	35.69%
Inflammatory vitiligo	3	1.12%
Halo nevus (n = 551)	23	4.17%
Trunk	13	56.52%
Upper extremity	5	21.74%
Lower extremity	4	17.39%
Head and neck	3	13.04%
Halo nevus number		
1	17	73.91%
2	5	21.74%
4	1	4.35%
Leukotrichia (n = 540)	102	18.89%

Notes: [a]Numbers do not always match total number of patients (n = 573) due to missing values.[b]All percentages are from the total number of vitiligo patients (n = 573) except for segmental vitiligo subtypes.
Abbreviation: VIDA score, Vitiligo Disease Activity score.

confetti-like depigmentation. Halo nevi and leukotrichia were present in 4.17% and 18.89%, respectively. Leukotrichia was mainly detected over the lower extremity, face, and scalp (Figure 2).

Autoimmune comorbidities were documented in 41% of patients, approximately 57% had family members with autoimmune diseases (Table 4). Allergic rhinitis or conjunctivitis, hypothyroidism, and asthma were the most prevalent systemic diseases, while alopecia areata, atopic dermatitis, and psoriasis were the top skin conditions. A similar pattern was noted for family history of autoimmune diseases. Type 2 diabetes mellitus was found in 12% of patients and in 47% of family members. Several laboratory abnormalities were detected (Table 5). Vitamin D level was low in 87%, most of them were vitamin D deficient. Antithyroglobulin antibodies and thyroid peroxidase antibodies were high in 21.76% and

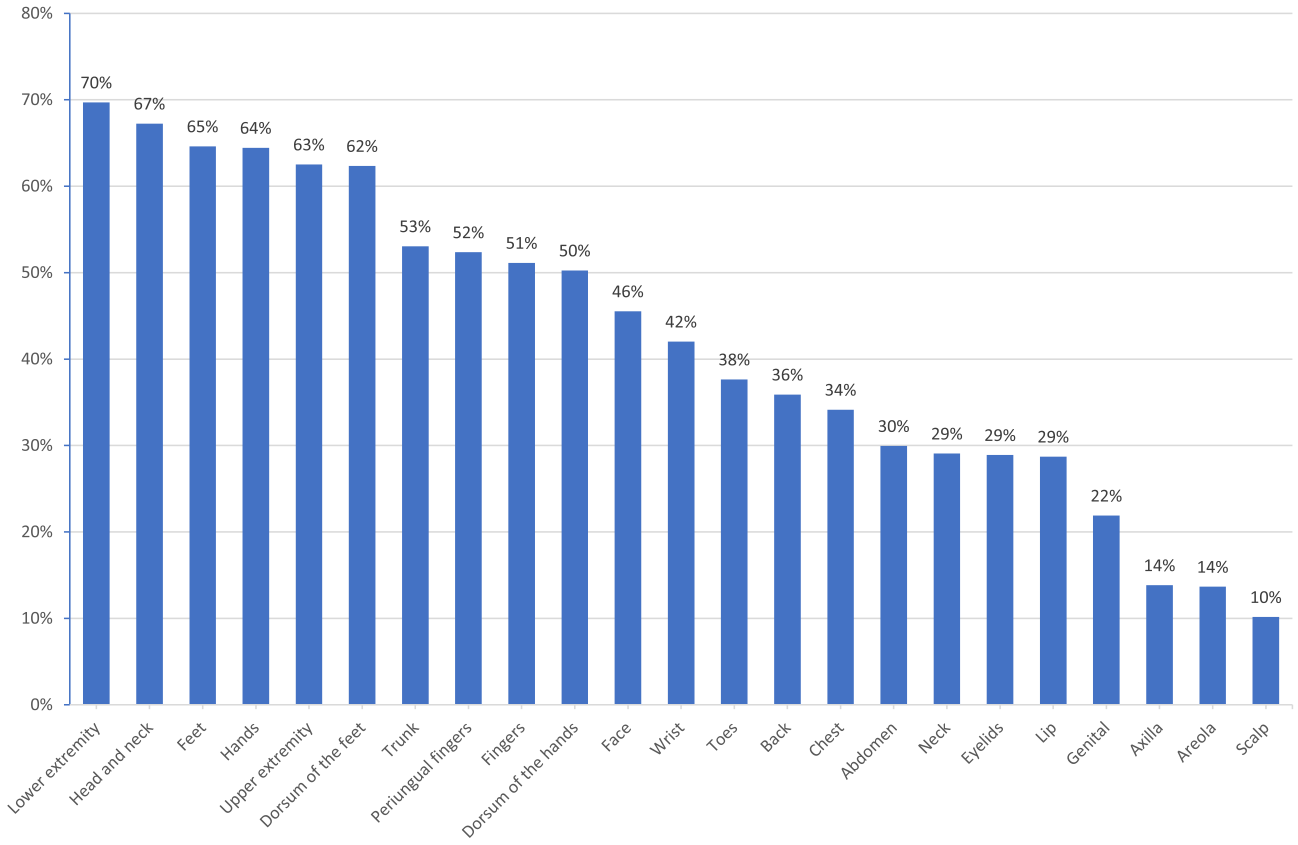

Figure 1 Body sites affected by vitiligo (n = 571).

35.65%, respectively. Low zinc was found in approximately 45% and erythrocyte sedimentation rate (ESR) was elevated in 61%. Elevated ESR was observed more in patients with clinical signs of activity (70% vs 54%, p-value 0.0007).

Discussion

The prevalence of vitiligo in our study was estimated to be 0.235%. This is similar to the worldwide prevalence reported in two recent systematic reviews with a range from 0.2% to 0.36%.[18,19] In addition, a vitiligo prevalence of 0.36% was estimated from a random sample of female school children in the eastern region of Saudi Arabia.[20] Of all patients seen in dermatology clinics, 5.87% had vitiligo. Such high proportion was previously reported in the central (2.69%),[21] eastern (5%),[22] and southern (2.8%)[23] regions of Saudi Arabia.

Most of our patients developed vitiligo at a young age, with 24 years being the mean age of onset. Similarly, Alkhateeb et al found the mean age of onset to be around 24 years in a large vitiligo cohort from North America and the United Kingdom.[24] In our study, approximately 30% and 50% developed vitiligo before the ages of 12 and 20 years, respectively, which is in agreement with previously published data.[25–27] Our results showed that vitiligo was more common in females. This might be due to more concerns about appearance and stigmatization among females. Although there are some conflicting findings in the literature regarding sex distribution in vitiligo,[18,19] several local studies showed more occurrence of vitiligo in females.[26,28]

Family history of vitiligo was present in 42% of our patients. Alissa A et al reported that 42.8% of Saudi patients with vitiligo had a family member with vitiligo.[28] This figure is higher than the ones reported in India (15.9%),[29] China (9.8%),[30] and Italy (31.2%).[31] The higher proportion of patients with positive family history in Saudi patients might be explained by the more likelihood of consanguinity in the Saudi population. A recent case-control study found that both family history and consanguinity were more common in Saudi patients with vitiligo.[32]

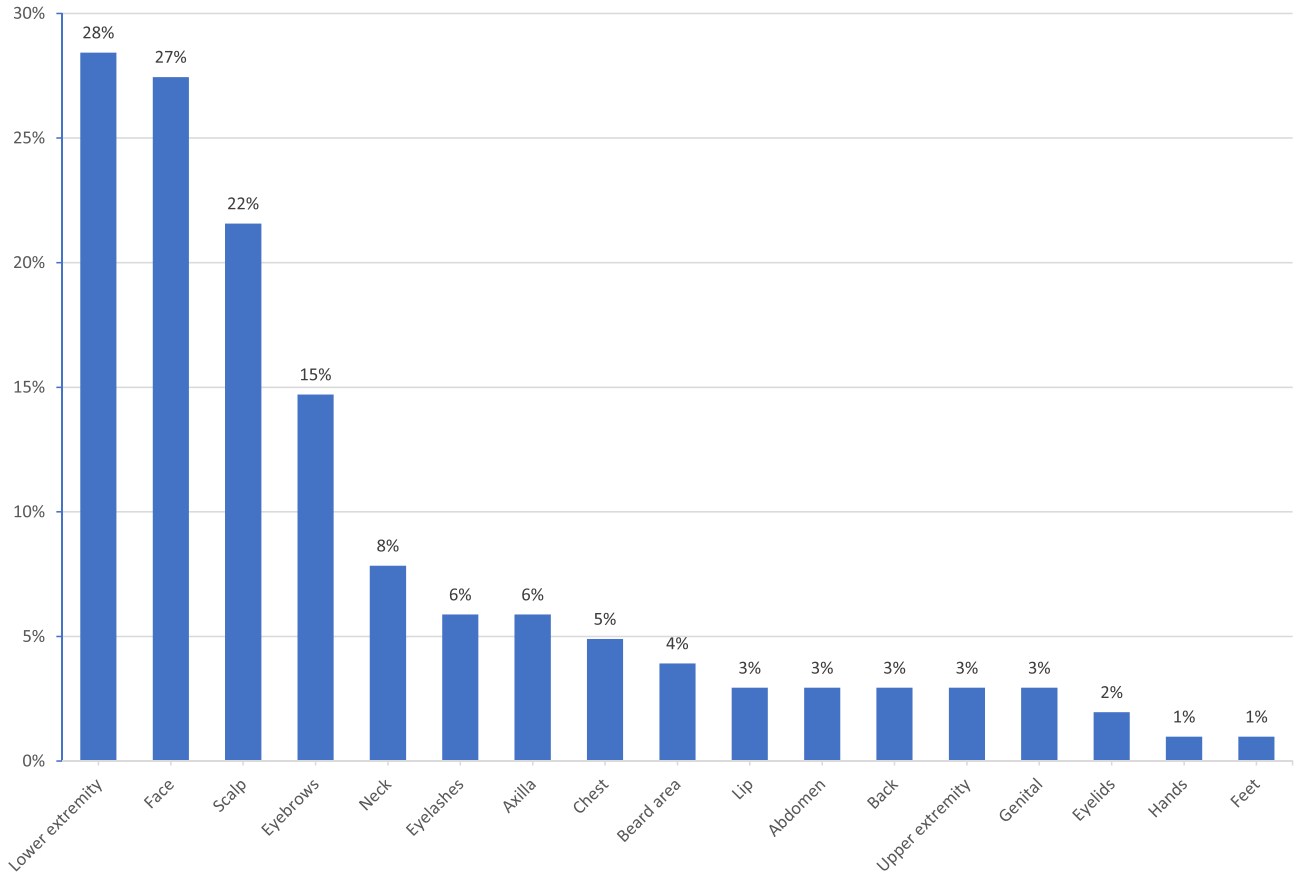

Figure 2 Body sites affected by leukotrichia (n = 102).

Among our patient cohort, 32% had a triggering factor. Stress was the most common factor, which was documented in 24%. Likewise, stress was considered by 27% of patients to be a contributing factor in another local study.[28] Environmental triggers appear to be commonly reported among vitiligo patients according to prior reports. Emotional stress was among the top ones.[33,34]

Generalized, acrofacial, and focal vitiligo clinical types are the most common ones reported in the literature.[27–29] Generalized vitiligo is consistently the most common type overall, which is in agreement with our results. Variations in

Table 4 Personal and Family History of Autoimmune Comorbidities in Patients with Vitiligo

Comorbid Autoimmune Disease (n = 573)	**n**	**%**	**Family History of Autoimmune Disease (n = 490)[a]**	**n**	**%**
Allergic rhinitis or conjunctivitis	98	17.10%	Thyroid disease	147	30.00%
Thyroid disease	90	15.71%	Asthma	100	20.41%
Hypothyroidism	80	13.96%	Allergic rhinitis or conjunctivitis	78	15.92%
Asthma	55	9.60%	Atopic dermatitis	63	12.86%
Alopecia areata	17	2.97%	Alopecia areata	34	6.94%
Atopic dermatitis	15	2.62%	Hypothyroidism	24	4.90%
Other thyroid disease	10	1.75%	Diabetes mellitus type 1	24	4.90%

(*Continued*)

Table 4 (Continued).

Comorbid Autoimmune Disease (n = 573)	n	%	Family History of Autoimmune Disease (n = 490)[a]	n	%
Psoriasis	9	1.57%	Psoriasis	17	3.47%
Diabetes mellitus type I	9	1.57%	Rheumatoid arthritis	10	2.04%
Urticaria	7	1.22%	Multiple sclerosis	9	1.84%
Hyperthyroidism	3	0.52%	Inflammatory bowel disease	5	1.02%
Sjögren syndrome	3	0.52%	Celiac disease	4	0.82%
Celiac disease	3	0.52%	Systemic lupus erythematosus	3	0.61%
Systemic lupus erythematosus	2	0.35%	Hyperthyroidism	1	0.20%
Rheumatoid arthritis	2	0.35%	Other thyroid disease	1	0.20%
Ulcerative colitis	2	0.35%	Ankylosing spondylitis	1	0.20%
Lichen planus	1	0.17%	Addison disease	1	0.20%
Paraneoplastic pemphigus	1	0.17%			
Pigmented purpuric dermatosis	1	0.17%			
Morphea	1	0.17%			
Juvenile idiopathic arthritis	1	0.17%			
Addison disease	1	0.17%			
Crohn disease	1	0.17%			
Multiple sclerosis	1	0.17%			
Vogt-Koyanagi-Harada disease	1	0.17%			
Guillain-Barré syndrome	1	0.17%			
Takayasu arteritis	1	0.17%			
Immune thrombocytopenia	1	0.17%			
Familial Mediterranean fever	1	0.17%			

Notes: [a]Number does not match total number of patients (n = 573) due to missing values.

Table 5 Laboratory Abnormalities in Patients with Vitiligo

	n	%	n total[a]
Antithyroglobulin antibodies (High)	99	21.76%	455
Thyroid peroxidase antibodies (High)	159	35.65%	446
Thyroid stimulating hormone (High)	42	8.05%	522
Thyroid stimulating hormone (Low)	12	2.30%	522
Antinuclear antibody (Positive)	53	12.96%	409
Zinc (Low)	173	44.70%	387

(*Continued*)

Table 5 (Continued).

	n	%	n total[a]
Erythrocyte sedimentation rate (High)	260	61.32%	424
C-reactive protein (High)	70	16.91%	414
Hemoglobin A1c (High)	74	15.61%	474
Hemoglobin (Low)	83	15.90%	522
Ferritin (Low)	52	10.90%	477
Ferritin (High)	13	2.73%	477
Rheumatoid factor (High)	33	8.85%	373
Tissue transglutaminase IgA antibodies (High)	16	4.28%	374
Vitamin B12 (Low)	32	6.87%	466
Vitamin D level			
Deficiency (< 50 nmol/L)	336	64.99%	517
Insufficiency (50–75 nmol/L)	115	22.24%	517
Sufficiency (≥ 75 nmol/L)	66	12.77%	517

Notes: [a]Numbers do not match total number of patients (n = 573) due to missing values.

acrofacial and focal vitiligo proportions are probably due to differences in definitions used in different studies. Nevertheless, the top vitiligo types in our study were similar to those found in a Saudi population by Alissa A et al.[28] Some of our patients (2.27%) had isolated facial involvement. Future investigation of this observation might be required. Segmental vitiligo accounted for approximately 6% of all vitiligo cases in our study. The prevalence of segmental vitiligo in previous studies ranged from 5% to 27.9%.[35]

Several signs of vitiligo activity were previously described. The main ones linked to vitiligo activity include: Koebner phenomenon, confetti- like depigmentation, hypochromic areas, and inflammatory vitiligo.[16] Approximately 50% of our patients had at least one sign of activity. In a study of 458 patients with vitiligo, signs of activity were noted in 47%.[36] Hypochromic areas and confetti-like depigmentation were the most prevalent in our patients, which is similar to the findings in a recently developed tool for vitiligo activity.[17] Inflammatory vitiligo is characterized by peripheral erythema with or without raised borders. This sign is considered rare and was only observed in a few patients in our study.[16] Itch within vitiligo lesions was present in 25% of our patients. Similarly, itch was documented in 20% of vitiligo patients in study from Thailand. When coexisted with Koebner phenomenon, the authors found the majority of those patients to have active disease.[37] In the clinic, we commonly observe high ESR levels in patients with signs of activity on examination. Our data show that ESR was more likely to be elevated in patients with clinical signs of activity. In patients with chronic spontaneous urticaria, a significant correlation between ESR and disease activity was found.[38] This is a simple test that might be useful to monitor vitiligo activity. However, additional research in this area is required.

The rate of halo nevi in patients with vitiligo varies in different studies ranging from 1% to 48%.[39] Halo nevi were documented in 4% in our study, which is comparable to results from India and China.[27,29] Leukotrichia is known to be a poor prognostic factor in vitiligo. It is seen in 9% to 48% of patients with vitiligo.[40] The prevalence of leukotrichia in our patients was lower than in other studies.[29,40] This is partially due to inclusion of only cases with at least 30% of the affected area having white hair. The lower extremity, face, and scalp were the most common sites with leukotrichia. Interestingly, two patients had leukotrichia on the eyelids (not the eyelashes). This can only be detected by dermoscopy as we previously described for the head and neck areas.[41] The use of dermoscopy for the eyelids is important to keep in mind as it might help in predicting treatment response.

Vitiligo is known to be associated with a wide range of autoimmune diseases. Thyroid disease and atopy were very common in our patients. Furthermore, a high proportion had positive antithyroid antibodies. Alopecia areata, atopic dermatitis, and psoriasis were the top cutaneous autoimmune conditions observed in our study. In a recent meta-analysis of comorbidities in vitiligo, a highly significant association with thyroid disease was noted. Accordingly, the authors recommend routine screening for thyroid function in patients with vitiligo.[42] The meta-analysis also shows increased risk of atopy in general, atopic dermatitis, alopecia areata, and psoriasis. Similarly, a previous study among Saudi patients showed that atopic dermatitis, alopecia areata, and psoriasis are common co-occurrences.[28] The majority of our patients had low vitamin D with more than half being vitamin D deficient. The association between vitiligo and low vitamin D level is well-documented.[43–45] Sun avoidance in patients with vitiligo is a possible explanation for this association. Alternatively, low vitamin D might increase the risk of vitiligo development. However, current evidence does not support this hypothesis.[43]

The strength of our study is that detailed analysis of vitiligo was based on a standardized format, which is routinely used in the clinic. This followed the most recent recommendations by vitiligo experts. Unfortunately, such standardized approach is not followed in other clinics which lead to loss of meaningful data that would have been useful to include in the analysis. However, prevalence, age at diagnosis, and sex were all determined based on vitiligo patients seen in all dermatology clinics. The inclusion of only vitiligo cases diagnosed by a dermatologist might be have resulted in missing some true vitiligo cases. Nonetheless, this was needed to ensure diagnostic accuracy. Incomplete patient records, a disadvantage of retrospective studies, led to missing values in some of our study variables. While the missing data did not significantly impact the overall conclusions, caution should be exercised when interpreting certain variables with substantial missing values. Another limitation of our study is that it is based on a single center and might not be generalizable to all the Saudi population.

Conclusions

A vitiligo prevalence of 0.235% was estimated in this work, which is similar to worldwide figures. This needs to be verified at a national level as it might have implications on prioritizing health care for patients with vitiligo. Family history of vitiligo was strikingly higher in our patients than in other countries. The true effect of consanguinity in this regard among Saudi patients with vitiligo needs further investigation with well-designed genetic studies. A quarter of our patients reported stress as triggering and/or exacerbating factor. This emphasizes the importance of psychological support in those patients. Half of our patients had signs of activity, which has to be kept in mind to prevent progression of vitiligo to areas that are difficult to treat. Thyroid disease and low vitamin D were both very common and should be routinely investigated. The interesting findings of isolated facial vitiligo, eyelid leukotrichia, and high ESR in active vitiligo might warrant additional research. This study will hopefully serve as a foundation for more focused studies in our region and worldwide.

Abbreviations

ESR, Erythrocyte sedimentation rate; IQR, Interquartile range; NSV, Nonsegmental vitiligo; SD, Standard deviation; SV, Segmental vitiligo; VETF, Vitiligo European Task force; VIDA, Vitiligo Disease Activity.

Data Sharing Statement

The data supporting the findings of this study are available upon reasonable request.

Ethical Approval

Approved by the institutional ethics committee at King Abdullah International Medical Research Center (NRC21R/295/07).

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Disclosure

The author reports no conflicts of interest in this work.

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