

Epidemiology and Treatment Patterns of Patients With Vitiligo: A Real-World Analysis

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Supplementary Table S1: ICD-9 codes for immune-mediated, psychological, additional comorbidities, and cancer.

Comorbidities			ICD-9 codes, unless otherwise specified
Immune-mediated comorbidities (defined by ≥2 diagnosis codes from any physician)	Skin and subcutaneous tissue	Atopic dermatitis	691.8
		Dermatitis herpetiformis	694
		Pemphigus vulgaris	694.4
		Discoid lupus erythematosus	695.4
		Psoriasis	696.1
		Lichen sclerosis	697.9
		Prurigo nodularis	698.3
		Morphea	701
		Alopecia areata	704.01
		Hidradenitis suppurativa	705.83
	Musculoskeletal system and connective tissue	Systemic lupus erythematosus	710
		Scleroderma	710.1
		Sjogren's syndrome	710.2
		Dermatomyositis	710.3
		Rheumatoid arthritis	714
		Ankylosing spondylitis	720
	Endocrine, nutritional, and metabolic diseases, and immunity disorders	Graves' Disease	242
		Hashimoto's Thyroiditis	245.2
		Addison's disease	255.4
		Autoimmune polyglandular syndrome	258.1
		Selective immunoglobulin A deficiency	279.01
	Nervous system	Guillain-Barre syndrome	357
		Myasthenia gravis	358
		Vogt-Koyanagi-Harada disease	364.24
	Digestive system	Inflammatory bowel disease (ulcerative colitis, Crohn's disease)	555, 556
		Celiac disease	579
	Other	Sarcoidosis	135
		Rheumatic fever	391
		Idiopathic thrombocytopenic purpura	287.31
Psychological comorbidities (defined by	Depression		311, 300.4, 296.2, 296.3
	Anxiety		300.0X
	Suicide tendency		300.9
	Suicide attempt		958.9

≥2 diagnoses codes)	Sleep disorder/insomnia	780.52, 780.53 (excluding sleep apnea)
	Sexual dysfunction	302.7
	Agoraphobia	300.21
	Social phobia	300.23
	Personality disorder	301.X
	Schizophrenia	295.X
	Episodic mood disorders	296.X
	Attention deficit hyperactivity disorder	314.01
	Eating disorder	307.5
	Alcohol dependency & complications	291.X, 303.X
	Drug addiction	304.X
Additional comorbidities (defined by ≥2 diagnoses codes)	Photosensitivity	692.72
	Diabetes mellitus (type 1, type 2)	According to MHS diabetes registry
	Pernicious anemia (vitamin B-12 deficiency)	281
	Multiple sclerosis	340
	Ocular abnormalities (uveitis, iris/retinal pigmentary changes, glaucoma)	365.9
	Hearing loss	389.9
	Anemia	285.9
	Itch (unspecified pruritic disorder)	698.9
	Cerebellar ataxia	334.3
	Helicobacter pylori infection	41.86
Cancer	Any type	According to records from the Israeli National Cancer Registry
	Melanoma	
	Non-melanoma skin cancer	

Abbreviations: ICD-9, International Classification of Diseases, Ninth Revision; MHS, Maccabi Health Services.

Supplementary Table S2: Comorbidities by disease severity.

n (%) unless otherwise stated	Overall (N=11,412)	Not defined (n=2890)	Mild^a (n=4698)	Moderate to severe^b (n=3824)	<i>p</i> value	SMD
Any psychological comorbidity	2129 (18.7)	432 (14.9)	749 (15.9)	948 (24.8)	<0.001	0.17
Depression	1235 (10.8)	235 (8.1)	400 (8.5)	600 (15.7)	<0.001	0.16
Sleep disorder/insomnia	668 (5.9)	113 (3.9)	215 (4.6)	340 (8.9)	<0.001	0.14
Anxiety	421 (3.7)	79 (2.7)	129 (2.7)	213 (5.6)	<0.001	0.10
Sexual dysfunction	36 (0.3)	2 (0.1)	12 (0.3)	22 (0.6)	<0.001	0.06
Any immune-mediated comorbidity	3389 (29.7)	577 (20.0)	1397 (29.7)	1415 (37.0)	<0.001	0.26
Atopic dermatitis	1421 (12.5)	291 (10.1)	681 (14.5)	449 (11.7)	<0.001	0.09
Morphea	214 (1.9)	34 (1.2)	79 (1.7)	101 (2.6)	<0.001	0.07
Alopecia areata	251 (2.2)	26 (0.9)	131 (2.8)	94 (2.5)	<0.001	0.09
Hashimoto's thyroiditis	336 (2.9)	55 (1.9)	122 (2.6)	159 (4.2)	<0.001	0.09

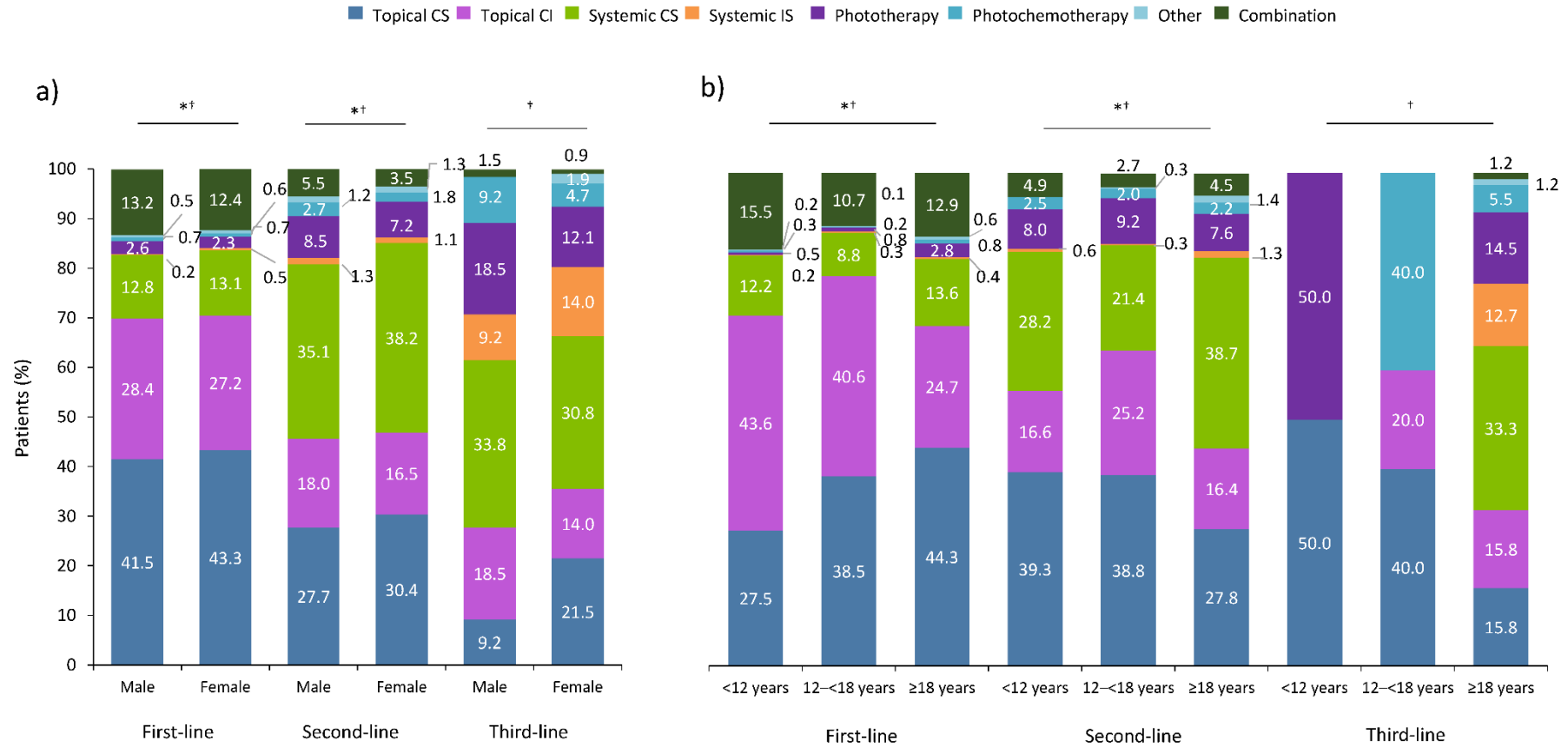
Abbreviations: SMD, standardized mean difference. ^aMild vitiligo: ≥1 purchase of a topical CS or CI, among patients not previously defined as moderate to severe; ^bmoderate to severe vitiligo: defined by ≥1 purchase of a systemic corticosteroid and/or ≥1 purchase of a systemic immunosuppressant and/or ≥1 course of phototherapy or photo chemotherapy.

Supplementary Table S3: Demographics by age group.

n (%) unless otherwise stated	<12 years (n=983)	12-<18 years (n=1347)	≥18 years (n=9082)	p value	SMD
Sex				0.068	0.04
Male	455 (46.3)	635 (47.1)	4489 (49.4)		
Female	528 (53.7)	712 (52.9)	4593 (50.6)		
Smoking status				<0.001	0.28
Never	36 (94.7)	525 (98.3)	7922 (88.4)		
Ever	2 (5.3)	9 (1.7)	1039 (11.6)		
Unknown, n	945	813	121		
CCI				<0.001	0.46
Mean±SD	0.1 ±0.3	0.1 ±0.4	0.9 ±1.6		
Median (IQR)	0 (0, 0)	0 (0, 0)	0 (0.0, 1.0)		
Disease duration				<0.001	0.49
<4 years	579 (58.9)	337 (25.0)	2455 (27.0)		
≥4 years	404 (41.1)	1010 (75.0)	6627 (73.0)		
Age at diagnosis				<0.001	2.38
Mean±SD	4.2 ±2.9	7.4 ±4.1	42.1 ±16.2		
Median (IQR)	4.0 (2.0, 6.0)	7.0 (4.0, 11.0)	42.0 (31.0, 54.0)		
Diagnosing physician/ setting					
Dermatologist	910 (92.6)	1,275 (94.7)	8711 (95.9)	<0.001	0.10
Hospital	5 (0.5)	0 (0)	84 (0.9)	<0.001	0.10
Any physician	246 (25.0)	350 (26.0)	2089 (23.0)	0.028	0.05
Disease severity				<0.001	0.33
Not defined	363 (36.9)	426 (31.6)	2101 (23.1)		
Mild	433 (44.0)	673 (50.0)	3592 (39.6)		
Moderate to severe	187 (19.0)	248 (18.4)	3389 (37.3)		
Time to first treatment, months				<0.001	0.28
Mean±SD	6.0 ±13.3	11.6 ±26.5	15.9 ±30.8		
Median (IQR)	0.0 (0.0, 5.0)	0.0 (0.0, 7.0)	0.0 (0.0, 17.0)		

Abbreviations: CCI, Charlson Comorbidity Index; IQR, interquartile range; SD, standard deviation; SMD, standardized mean difference.

Supplementary Figure S1: Treatment sequencing by (a) sex and (b) age group.



* $p < 0.05$; † SMD > 0.1 or ≤ -0.1 . CI, calcineurin inhibitors; CS, corticosteroids; IS, immunosuppressants; SMD, standardized mean difference.