Comorbid autoimmune diseases in patients with vitiligo: A cross-sectional study

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Background: Few large-scale studies have quantified the burden of comorbid autoimmune diseases in patients with vitiligo.

Objective: We sought to determine the prevalence of comorbid autoimmune diseases in patients with vitiligo.

Methods: We conducted a manual chart review on a cohort of 1873 patients with vitiligo seen between January 2002 and October 2012 at the Henry Ford Health System in Detroit, MI. Patients were excluded if they had fewer than 2 dermatology notes (N = 595) or if they were never given a diagnosis of vitiligo by a dermatologist (N = 180).

Results: Of 1098 patients with vitiligo, nearly 20% had at least 1 comorbid autoimmune disease. Compared with the general US population, we found a higher prevalence of thyroid disease (12.9%, $P < .001$), alopecia areata (3.8%, $P < .001$), inflammatory bowel disease (0.9%, $P = .046$), pernicious anemia (0.5%, $P = .007$), systemic lupus erythematosus (0.3%, $P = .048$), Guillain-Barre syndrome (0.3%, $P < .001$), discoid lupus (0.2%, $P = .003$), linear morphea (0.2%, $P < .001$), myasthenia gravis (0.2%, $P = .002$), and Sjögren syndrome (0.2%, $P = .011$).

Limitations: The study lacked a control group. This was a single-institution study with possible selection bias, and thus the findings may not be representative of the overall population of patients with vitiligo.

Conclusions: We observed a high prevalence of comorbid autoimmune diseases in patients with vitiligo and report several new associations. (J Am Acad Dermatol 2016;74:295-302.)

Key words: alopecia areata; associations; autoimmune disease; comorbidities; prevalence; thyroid disease; vitiligo.

Vitiligo is characterized by selective loss of melanocytes and patchy depigmentation of the skin and mucous membranes. The estimated prevalence is 0.5% to 1%.[1] The origin of vitiligo is thought to be a complex interplay of genetics, environment, oxidative stress, and autoimmunity.[2,3]

Abbreviations used:

BSA:	body surface area
IBD:	inflammatory bowel disease
SLE:	systemic lupus erythematosus
TPO:	thyroid peroxidase
TSH:	thyroid-stimulating hormone
T1DM:	type 1 diabetes mellitus

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Vitiligo is associated with other autoimmune diseases, especially thyroid disease.[1,4,5] Other autoimmune diseases reported in patients with vitiligo vary depending on the population studied; these include alopecia areata,[6-12] Addison disease,[4,5,9,13] autoimmune gastritis,[9] inflammatory bowel disease (IBD),[4,8] pernicious anemia,[4,5,14,15] psoriasis,[5,8] rheumatoid arthritis,[5,8] systemic lupus erythematosus (SLE),[4,5,8] and type 1 diabetes mellitus (T1DM).[5] First-degree relatives of patients with vitiligo have higher frequencies of vitiligo and the aforementioned autoimmune diseases than the general population.[4]

CAPSULE SUMMARY

- Vitiligo is associated with other autoimmune diseases, especially autoimmune thyroid disease.
- Our study shows that vitiligo is associated with alopecia areata, inflammatory bowel disease, pernicious anemia, systemic lupus erythematosus, and unexpectedly Guillain-Barre syndrome, linear morphea, myasthenia gravis, discoid lupus, and Sjögren syndrome.
- Providers should be aware of comorbidities in vitiligo.

METHODS

This cross-sectional study was approved by the Henry Ford Hospital Institutional Review Board (no. 7943). The study population included patients with an *International Classification of Diseases, Ninth Revision* diagnostic code of 709.01 for vitiligo who presented to the Henry Ford Hospital Department of Dermatology in Detroit, MI, between January 2002 and November 2012.

Initial search of the Henry Ford Hospital Medical Record Database yielded 1873 cases. All dermatology notes and most recent primary care notes were manually reviewed. Specialty care notes were reviewed if further clarification of a diagnosis was needed. Patients were excluded if they had fewer than 2 encounters with dermatology (N = 595) or if they did not have a diagnosis of vitiligo by a dermatologist (N = 180). The final population included 1098 patients with vitiligo.

Information collected from chart review included gender, race, date of birth, age of onset, duration of vitiligo, type of vitiligo, percentage of body surface area (BSA) affected, and medical history of autoimmune disease. Current age was calculated as of February 2014. Duration of vitiligo was calculated by subtracting age of onset from current age. Race was determined by the patient's response to a standard questionnaire.

Type of vitiligo was recorded as stated in the assessment of the dermatology note. Patients were grouped as having nonsegmental vitiligo, segmental vitiligo, or undetermined type according to the Vitiligo Global Issues Consensus Conference classification and consensus nomenclature.[16] For the purposes of analysis, percentage of BSA affected was categorized as 0% to 10%, 11% to 20%, 21% to 50%, or greater than 50%. Although there is no consistent method of categorizing extent of vitiligo, most dermatologists experienced in treating vitiligo consider greater than 50% involvement to be severe.[17,18]

Diseases were considered to be autoimmune if they were included in the list of 81 autoimmune diseases specified by Hayter and Cook,[19] with the addition of psoriasis because of mounting evidence of the role of the immune system in its pathogenesis.[20,21] Thyroid disease was defined as hypothyroidism, hyperthyroidism, Graves disease, Hashimoto thyroiditis, or autoimmune thyroiditis. Laboratory data collected included thyroid-stimulating hormone (TSH) levels, and antinuclear, anti-thyroid peroxidase (TPO), and antithyroglobulin antibody results. Standard laboratory values were used to designate low, normal, or high levels.

Statistical analysis

Age of onset, current age, and vitiligo duration were compared between patients with no comorbid autoimmune disease and patients with at least 1 comorbid autoimmune disease using the Wilcoxon rank sum test.[22] The standard χ^2 test was used to compare the percentages of patients with at least 1 comorbid autoimmune disease in nonsegmental vitiligo and segmental vitiligo; and the individual autoimmune disease prevalence among the 3 main race groups (white, black, and other) and between male and female patients. The Cochran-Armitage trend test was used to test the association of a group (patients with vitiligo and no comorbidities vs those with at least 1 comorbidity) with affected BSA ($\leq$10%, 11%-20%, 21%-50%, and >50%). The χ^2 test for specified proportions was used to compare the prevalence of various autoimmune diseases in patients with vitiligo to the corresponding prevalence in the general US population.[23] The most recent prevalence data for each autoimmune disease were selected for comparison. Data obtained from the most geographically similar population were used when available.[24] World prevalence was used when US prevalence data were not available. For the