The Prevalence and Accuracy of Self-Reported History of 11 Autoimmune Diseases

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ABSTRACT. ***Objective.*** To determine the prevalence and confirmation rate of autoimmune diseases reported by relatives of patients with lupus and controls.

Methods. Medical histories were obtained by self-report from 626 first-degree relatives of lupus patients and 267 population controls.

Results. Of 178 reports of an autoimmune disease, 44% were confirmed by medical records; excluding those whose medical records were unavailable, the confirmation rate was 76%. The prevalence of at least one confirmed autoimmune disease was 12% in lupus relatives and 2% in controls.

Conclusion. Methods to improve the reliability of self-reported autoimmune disease history could enhance population and clinic-based research. (First Release Sept 1 2008; J Rheumatol 2008; 35:2001–4)

Key Indexing Terms:
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Studies have evaluated the accuracy of self-reported history of rheumatoid arthritis[1-3] or systemic lupus erythematosus (SLE)[4,5]. Little is known about the accuracy of reports of other autoimmune diseases, however, and about factors that may affect reporting accuracy, such as family history of autoimmune disease. We determined the confirmation rate of various autoimmune diseases in relatives of patients with lupus and in population-based controls, and the prevalence of these autoimmune diseases in these groups.

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MATERIALS AND METHODS

The study protocol was approved by the ethics review boards of all participating institutions. Probands (SLE patients) were recruited from 11 rheumatology clinics across Canada. These clinics were members of the Canadian Network for Improved Outcomes in SLE (CaNIOS). Patients had 4 or more of the revised American College of Rheumatology (ACR) classification criteria and had 2 live parents who also agreed to participate in the study. In addition to parents, siblings of the patients were also invited to participate. This analysis is based on data from 893 total subjects, consisting of 626 first-degree relatives of the patients (246 mothers, 246 fathers, 134 siblings), and 267 controls selected through random-digit dialing, frequency-matched to cases by area of residence, sex, and age. (We excluded one sibling because of missing data pertaining to the medical history questions.)

A structured questionnaire, completed in a clinic setting, was used to obtain information about the medical history of the relatives of the SLE patients and the controls. This questionnaire included a set of questions concerning the diagnosis of specific autoimmune diseases, i.e., "Has a doctor ever told you had..." for 11 diseases. The specific diseases, and the phrasing that was used, were: under-active thyroid, hypo-thyroidism, or Hashimoto's thyroiditis; over-active thyroid, hyperthyroidism, or Graves' disease; rheumatoid arthritis (RA); systemic lupus erythematosus or SLE; scleroderma (also called systemic sclerosis or CREST); Sjögren's syndrome; polymyositis or dermatomyositis; antiphospholipid antibody syndrome (APS); hemolytic anemia; multiple sclerosis; and vitiligo – patchy skin discoloration. "Yes" responders were asked for their age when first diagnosed with the disease, and were asked for written permission to review medical records from the relevant physician. Contact information for the physician was obtained from the participant, and letters were sent to the physician(s) asking for the relevant records. Followup telephone calls were placed as needed to the physicians' offices.

We reviewed the medical records upon receipt, and classified the self-reports as "confirmed positive" if the record indicated the patient had been

diagnosed or was being treated for the condition; "confirmed negative" if the chart clearly stated that the patient did not have the condition or if the doctor wrote back specifically saying that the patient did not have the condition; and "not verified" if for any reason no chart review was available or if there was no mention of the condition. In addition to the report of the diagnosis or treatment, we looked for specific information pertaining to a condition (e.g., presence of a specific autoantibody or other relevant laboratory results), but did not require strict fulfillment of ACR classification criteria.

The SLE patients (the probands) were asked whether their mother or father had been diagnosed with SLE or lupus. We used this information to compare the SLE patient's report of family history of SLE to the information provided by the family member.

We examined the confirmation rates and prevalence of the 11 autoimmune diseases, among the first-degree relatives of SLE patients and among the controls. Because of the relative rarity of any of the autoimmune diseases among the controls, we used the data from the relatives of the lupus patients to examine how these rates varied by sex and age. These are descriptive analyses, rather than tests of specific hypotheses, so we did not include statistical analysis of differences among diseases or between groups.

RESULTS

More than half (63%) the study participants were female, and 82% were Caucasian. The median age was 62 years for the parents of the SLE patients, 34 years for the siblings, and 38 years for the population controls.

A total of 178 diagnoses of one of the autoimmune diseases were reported by the study participants (162 in SLE relatives and 16 in the controls; Table 1). Medical record information was obtained for 104 (58%) of these diagnoses. In all, 79 (44%) of the self-reported diagnoses were confirmed positive, 25 (14%) were confirmed negative, and 74 (42%) were not verified due to lack of information from medical records. Although the total confirmation rate was only 44%, excluding those diagnoses for which medical records were unavailable, the confirmation rate was 76% (Table 1). Relatively low confirmation rates were seen for RA and hemolytic anemia.

The prevalence of these autoimmune diseases was higher in the relatives of lupus patients compared with controls: 26% of lupus relatives and 6% of the controls reported a history of one or more of these 11 autoimmune diseases, and 12% of lupus relatives and 2% of controls had a confirmed history of one or more of these diseases (Table 1). The most common diseases in both groups were hypothyroidism, hyperthyroidism, and RA (Table 1). None of the other diseases were reported by any of the controls.

As expected, most of these diseases among the relatives of the lupus patients were more common in women than men (Table 2). There was little difference in the overall confirmation rate among women (44%) versus men (48%). The confirmation rate differed somewhat by age (36% for age < 45 yrs, 47% for age ≥ 45 yrs), due in large part to a difference in availability of medical records (41% for diagnoses in the younger group compared with 63% in the older group). When limited to age ≥ 45 years, the confirmation rate for RA remained low [among relatives, 13 of 56 reports (23%) and 13 of 29 reports with available medical records (45%) were confirmed positive].

Table 1. Confirmation of self-reported autoimmune diseases in 626 first-degree relatives of patients with SLE and 267 population controls.

	First-degree Relatives, n = 626					Controls, n = 267				
			Confirmed Diagnosis					Confirmed Diagnosis		
Disease	Reported, n	Medical Records Received, n (%)	n	% of All Reports*	% of Reports with Medical Records†	Reported, n	Medical Records Received, n (%)	n	% of All Reports*	% of Reports with Medical Records†
Hypothyroidism (Hashimoto's thyroiditis)	69	38 (55)	37	54	97	14	7 (50)	6	43	86
Hyperthyroidism (Graves disease)	27	15 (56)	14	52	93	2	0 (0)	0	0	None
Rheumatoid arthritis	60	31 (51)	15	25	48	2	0 (0)	0	0	None
SLE	24	17 (71)	15	63	88	0	—	—	—	—
Scleroderma (systemic sclerosis, CREST)	4	3 (75)	3	75	100	0	—	—	—	—
Sjögren's syndrome	9	7 (78)	6	67	86	0	—	—	—	—
Polymyositis or dermatomyositis	2	0 (0)	0	0	None	0	—	—	—	—
Antiphospholipid syndrome	5	1 (20)	1	20	100	0	—	—	—	—
Hemolytic anemia	13	4 (31)	1	8	25	0	—	—	—	—
Multiple sclerosis	4	3 (75)	2	50	67	0	—	—	—	—
Vitiligo	9	2 (22)	0	0	0	0	—	—	—	—
Total (any of these 11)††	162	97 (60)	73	45	75	16	7 (44)	6	38	86

* Percentage of those who reported the disease. † Percentage of those who reported the disease for whom relevant information was obtained from the medical records; "none" indicates no medical records relating to this disease were received. †† Participants could report more than one disease, so sum of individual diseases does not equal this total.

Table 2. Prevalence of autoimmune diseases in first-degree relatives of patients with SLE, based on self-report or medical record confirmation, by sex.

Disease	Total, n = 626		Female, n = 331		Male, n = 295	
	Based on Self-report, n (%)	Based on Medical Records, n (%)	Based on Self-report, n (%)	Based on Medical Records, n (%)	Based on Self-report, n (%)	Based on Medical Records, n (%)
Hypothyroidism (Hashimoto's thyroiditis)	69 (11.0)	37 (5.9)	56 (16.9)	29 (8.8)	13 (4.0)	8 (2.7)
Hyperthyroidism (Graves disease)	27 (4.3)	14 (2.2)	21 (6.3)	8 (2.4)	6 (2.0)	6 (2.0)
Rheumatoid arthritis	60 (9.6)	15 (2.4)	40 (12.1)	10 (3.0)	20 (6.8)	5 (1.7)
SLE	24 (3.8)	15 (2.4)	20 (6.0)	12 (3.6)	4 (1.4)	3 (1.0)
Scleroderma (systemic sclerosis, CREST)	4 (0.6)	3 (0.5)	2 (0.6)	1 (0.3)	2 (0.7)	2 (0.7)
Sjögren's syndrome	9 (1.4)	6 (1.0)	8 (2.4)	5 (1.5)	1 (0.3)	1 (0.3)
Polymyositis or dermatomyositis	2 (0.3)	0 (0.0)	2 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)
Antiphospholipid syndrome	5 (0.8)	1 (0.2)	5 (1.5)	1 (0.3)	0 (0.0)	0 (0.0)
Hemolytic anemia	13 (2.1)	1 (0.2)	8 (2.4)	1 (0.3)	5 (1.7)	0 (0.0)
Multiple sclerosis	4 (0.6)	2 (0.3)	3 (0.9)	1 (0.3)	1 (0.3)	1 (0.3)
Vitiligo	9 (1.4)	0 (0.0)	5 (1.5)	0 (0.0)	4 (1.4)	0 (0.0)
Total (any of these 11)*	162 (25.9)	73 (11.6)	114 (34.4)	50 (15.1)	48 (16.3)	23 (7.8)

* Participants could report more than one disease, so sum of individual diseases does not equal this total.

Seven of the SLE probands reported that their mother had been diagnosed with SLE or lupus, and 2 reported their father had been diagnosed with this condition. All 9 of these parents also reported this disease in their own medical history questionnaire; 5 were confirmed positive, one was confirmed negative, and 3 were not verified. Three additional parents (2 mothers and one father) also reported a history of SLE; 2 of these were confirmed positive and one was not verified.

DISCUSSION

The overall confirmation rate of self-reported autoimmune diseases in our study was 44%, but it was higher (76%) when we excluded diagnoses for which medical records were unavailable. Although RA was one of the most commonly reported diseases, its confirmation rate was notably lower than most of the other diseases we assessed. Our results are similar to those seen in other studies. In the Nurses Health Study[1], confirmation rates among women for whom medical records were obtained were 29% for RA and 69% for SLE. Similar figures for RA were seen in other cohorts of older women[2,3], and 84% of the self-reported lupus diagnoses were confirmed in the Black Women's Health Study[5].

The confirmation rate for thyroiditis was similar among relatives of SLE patients and controls. There were too few reports of the other autoimmune diseases among the controls to serve as a basis for comparing confirmation rates between these groups.

SLE patients correctly reported a history of lupus or SLE in 9 of the 12 parents who also reported this history, and in 5 of the 7 parents for whom this report was confirmed by medical record review. We cannot compare this level of agreement with that seen for other diseases because the proband questionnaire did not include specific questions about familial history of other autoimmune diseases.

The increased prevalence of autoimmune diseases in the first-degree relatives of SLE patients was expected. Family history of a variety of autoimmune diseases has been associated with risk of lupus[6,7], as well as Sjögren disease[8,9], multiple sclerosis[10], juvenile RA[11], RA[12], and myositis[13]. Some of these studies ascertained family history through the proband, but others involved a more detailed assessment including structured interviews with family members[11,13]. Recognition of the occurrence of multiple different autoimmune diseases within a family, or "familial autoimmunity," has stimulated interest in common susceptibility genes that may act in conjunction with environmental agents and other disease-specific genes to give rise to disease[14].

Our study provides a basis for estimating the actual prevalence of specific autoimmune diseases in a family-based study design and in general population samples. Additional information such as recent physician contact, use of specialty services, and medication use could potentially improve the accuracy of self-reported history of autoimmune diseases.

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