Published in final edited form as:

J Clin Rheumatol. 2007 August ; 13(4): 202–204. doi:10.1097/RHU.0b013e318124a8af.

Prevalence of systemic lupus erythematosus and associated comorbidities in Puerto Rico

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Abstract

Objective—To determine the prevalence of systemic lupus erythematosus (SLE) and its associated comorbidities in patients from Puerto Rico using a database from a health insurance company.

Methods—The insurance claims submitted by physicians in 2003 to a health insurance company of Puerto Rico were examined. Of 552,733 insured people, 877 had a diagnosis of SLE (code 710.0) per the International Classification of Diseases, Ninth Revision (ICD-9). Demographic parameters and selected comorbidities were determined. The diagnosis of comorbidities was ascertained using the ICD-9 code, the Current Procedural Terminology-4 (CPT-4) code (for disease specific procedures) and/or the Medi-Span Therapeutic Classification System (for disease specific pharmacologic treatment). Fisher exact test and Chi-square were used to evaluate differences between SLE patients groups.

Results—The mean age was 42.0 ± 13 and the female to male ratio was 12.5:1. The overall prevalence of SLE was 159 per 100,000 individuals. The prevalence for females was 277 per 100,000 women and for males it was 25 per 100,000 men. The most common comorbidities were high blood pressure (33.7%), osteopenia/osteoporosis (22.2%), hypothyroidism (19.0%), diabetes mellitus (11.6%) and hypercholesterolemia (11.6%). Overall, high blood pressure, diabetes mellitus, hypercholesterolemia, and coronary artery disease were more prevalent in SLE patients older than 54 years. Osteopenia/osteoporosis was more prevalent in women than in men.

Conclusions—The prevalence of SLE in Puerto Rico is very high. High blood pressure, diabetes mellitus, hypercholesterolemia, hypothyroidism and osteopenia/osteoporosis are common comorbidities in these patients. Identification and management of these comorbidities are critical for optimal medical care to this population.

Key indexing terms

Systemic lupus erythematosus; prevalence; comorbidities; Puerto Rico

Systemic lupus erythematosus (SLE) is an autoimmune disease characterized by a wide spectrum of clinical and immunological abnormalities (1). Epidemiological studies on the prevalence of SLE show a broad range among different ethnic populations (21.7 to 124 per 100,000 population), possibly related to variability in genetic and environment factors (2–9).

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Previously, we characterized the clinical manifestations, serologic abnormalities and outcome in Hispanics from Puerto Rico with SLE (10). In general, these patients have a mild form of disease predominantly manifested by cutaneous and musculoskeletal manifestations. Major organ involvement and disease damage are relatively infrequent (10, 11). Now, we have determined the prevalence and associated comorbidities of SLE in the Island of Puerto Rico using a large database from a health insurance company.

In 2003, 552,733 people (female: 293,486 and male: 259,247) residing in Puerto Rico had private healthcare insurance (corporate or individual) with Triple-S, Inc. Of the insurance claims submitted by physicians during that year, 877 participants had a diagnosis of SLE (code 710.0) per the International Classification of Diseases, Ninth Revision (ICD-9). Among SLE patients, 665 were seen by rheumatologists. All insurance claims submitted by healthcare providers (physicians, dentists, laboratories, pharmacies and hospitals) in 2003 for SLE patients were examined.

Demographic parameters (age and gender) and selected comorbidities were studied. Age was subclassified into four groups: <18, 18–34, 35–54 and >54 years. The assessment of the following comorbidities was done using the ICD-9 codes only: cerebral vascular accident and coronary artery disease (myocardial infarction and angina pectoris). The diagnosis of end-stage renal disease was made using ICD-9 codes and/or Current Procedural Terminology-4 codes (diagnosis and/or patients receiving hemodialysis or peritoneal dialysis, or patients having renal transplant). The assessment of the following disorders was done using the ICD-9 codes and/or disease specific pharmacologic treatment using the Medi-Span Therapeutic Classification System: hypothyroidism, hyperthyroidism, high blood pressure, diabetes mellitus, hypercholesterolemia and osteoporosis/osteopenia.

The Statistical Package of Social Sciences (SPSS Inc., Chicago IL) program was used to perform univariable and bivariable analyses. Univariable analyses were used to determine the frequencies of clinical conditions. Differences between SLE patients study groups were analyzed with the Chi-square and Fisher exact tests. The significance level of less than 0.05 was used for testing statistical significance.

Among SLE patients, 812 (92.6%) were females and 65 (7.4%) males, for a female to male ratio of 12.5:1. The mean age was 42.0 ± 13.5 years. The frequency of SLE patients in the <18, 18–34, 35–54, and >54 age groups was 4.0%, 25.0%, 52.5%, and 18.5% respectively. The overall prevalence rate of SLE was 159 per 100,000 inhabitants, 1 per 630 inhabitants. The prevalence rate of SLE among females was 277 per 100,000 or 1 per 361 women and for males it was 25 per 100,000 or 1 per 4,000 men.

Few patients had end-stage renal disease (2.1%). Hypothyroidism (19.0%) was commonly seen, but hyperthyroidism (0.3%) was infrequent. Cardiovascular risk factors were common in this population. Thirty-four percent of SLE patients presented high blood pressure, 11.6% had diabetes mellitus and 11.6% presented hypercholesterolemia. Coronary artery disease was observed in 5.8% and cerebrovascular accident was diagnosed in 1.6% of patients. Osteopenia/osteoporosis was reported in 22.2%. Osteopenia/osteoporosis was significantly more frequent in women than in men (23.3% vs. 9.2%, $p < 0.01$). No significant differences were found for other comorbidities between gender groups.

Table 1 shows the most common comorbidities in SLE patients by age groups. Overall, high blood pressure, diabetes mellitus, hypercholesterolemia, coronary artery disease and osteopenia/osteoporosis were significantly more frequent in patients older than 54 years. In females, patients older than 54 years had higher frequency of high blood pressure, diabetes mellitus, hypercholesterolemia, coronary artery disease and osteopenia/osteoporosis than other age groups, while hypothyroidism was more common in patients between 35 and 54

years of age. Among males, coronary artery disease was more prevalent in patients older than 54 years than other age groups. No significant differences were found for hypothyroidism, high blood pressure, diabetes mellitus, hypercholesterolemia and osteopenia/osteoporosis among men of different age groups. The present study has some limitations. First, we do not know the ethnicity of the insured patients. It is well known that clinical manifestations and outcome vary among patients of different ethnic backgrounds (2–5, 8, 9, 12). However, according to the 2000 US census the majority of people residing in Puerto Rico were Hispanics from Puerto Rico. Second, the diagnosis of SLE was based only on ICD-9 code, and not on the American College of Rheumatology classification criteria. However, most of these patients were seen and diagnosed by well-trained and qualified rheumatologists; therefore we assume the diagnosis was correct for nearly all of these cases. Third, we only included SLE patients with private health insurance and not those having the government healthcare program coverage who most are under poverty level. Several studies have shown that lower socioeconomic level is related with higher morbidity and mortality in SLE, therefore it is conceivable that the comorbidities studied here might be more common in the medically indigent population (13–15). Finally, we did not evaluate the prevalence the comorbidities studied here in the general population.

In conclusion, this is the first study that examines the prevalence of SLE in Puerto Rico. We found a high prevalence of SLE; 159 per 100,000 population. In addition, we observed that these patients had a high frequency of high blood pressure, high blood pressure and hypothyroidism. SLE patients aged >54 years had more commonly high blood pressure, diabetes mellitus, hypercholesterolemia, coronary artery disease, hypothyroidism and osteopenia/osteoporosis. The present study allows recognizing the most common comorbidities associated to SLE in Puerto Rico. This information might be helpful to design strategies for optimal medical care, particularly in the prevention and treatment of modifiable risk factors of atherosclerosis.

Acknowledgments

Supported by the National Center for Research Resources (NCRR/NIH) RCMI Clinical Research Infrastructure Initiative (RCRII) award #1P20 RR11126 (UPR-MSC) and an unrestricted educational grant from Bristol-Myers Squibb Company.

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Table 1

Selected comorbidities in SLE patients from Puerto Rico by age groups.

Comorbidities	<18 years %	18 – 34 years %	35 – 54 years %	>54 years %	P value
All patients (n=877)	n=35	n=219	n=461	n=162	
Hypothyroidism, %	20.0	12.8	21.7	19.8	0.052
High blood pressure, %	5.7	23.3	34.9	50.6	<0.001
Diabetes mellitus, %	5.7	7.8	11.5	18.5	0.008
Hypercholesterolemia, %	0.0	5.0	10.8	25.3	<0.001
Coronary artery disease, %	0.0	1.8	5.6	13.0	<0.001
Osteopenia/osteoporosis, %	5.7	8.7	23.6	40.1	<0.001
Female patients (n=812)	n=25	n=202	n=433	n=152	
Hypothyroidism, %	16.0	11.4	21.7	20.4	0.018
High blood pressure, %	4.0	22.8	34.2	50.7	<0.001
Diabetes mellitus, %	8.0	8.4	11.1	18.4	0.026
Hypercholesterolemia, %	0.0	5.0	10.9	25.7	<0.001
Coronary artery disease, %	0.0	1.5	6.0	11.8	<0.001
Osteopenia/osteoporosis, %	0.0	8.9	24.5	42.8	<0.001
Male patients (n=65)	n=10	n=17	n=28	n=10	
Hypothyroidism, %	30.0	29.4	21.4	10.0	0.646
High blood pressure, %	10.0	29.4	46.4	50.0	0.148
Diabetes mellitus, %	0.0	0.0	17.9	20.0	0.132
Hypercholesterolemia, %	0.0	5.9	10.7	20.0	0.440
Coronary artery disease, %	0.0	5.9	0.0	30.0	0.006
Osteopenia/osteoporosis, %	20.0	5.9	10.7	0.0	0.440