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Impact of immigration on the clinical expression of systemic lupus erythematosus: a comparative study of Hispanic patients residing in the USA and Mexico

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Objective. To compare the socio-economic characteristics, clinical features and health-related quality of life in Hispanic SLE patients residing in Mexico and in the Southwest USA (Mexican and Texan, herein).

Methods. Mexican and Texan SLE patients (fulfilling ACR criteria) participating in separate longitudinal outcome studies were evaluated. Texan patients were randomly chosen to match total disease duration with the Mexican patients. Cross-sectional data for the Mexican patients were obtained by a US-trained investigator who had previously participated in data collection for the cohort to which the Texan patients belonged. Socio-economic and -demographic characteristics, clinical characteristics, disease activity (with SLAM-Revised), damage accrual (with SLICC/ACR Damage Index) and self-reported function (with Short Form-36) were compared between the two groups.

Results. Seventy Mexican patients were matched with either one or two Texan patients ($n = 94$) for a total of 164 patients. Mexican patients were younger. In age-adjusted analyses, the Mexican patients were more educated, had better health-related quality of life and overall less systemic SLE manifestations. Mexican patients were exposed more frequently to AZA.

Conclusions. Texan patients had more severe disease than the Mexican patients. In multivariable analyses, Texan Hispanic ethnicity was significantly associated with high disease activity, but significance was not reached for damage. The discrepant findings observed between these two Hispanic groups of SLE patients may reflect socio-economic or biological factors. Given the global phenomenon of immigration, rheumatologists should be aware of the overall course and outcome of immigrant SLE patients if undesirable outcomes are to be prevented.

Key words: Systemic lupus erythematosus, Immigration, Hispanics, Mexicans.

Introduction

The term 'Hispanic' refers to individuals who share language and other cultural features, and trace their origin to Spanish cultures in Mexico, Puerto Rico, Cuba, Central and South America and other Spanish-speaking countries. Hispanics are the fastest growing minority group in the USA [1], going from 4.7% of the general population in 1970 to 12.5% in 2000; Mexico is the leading country of origin of Hispanic immigrants, accounting for 30% of the total foreign-born Hispanic US population [2].

Several studies in the USA have reported that geographical regions with significantly higher mortality rates in SLE patients tended to have high proportions of residents of Hispanic origin [3, 4]. Ethnic variation in the presentation and severity of SLE patients has been widely studied by the LUMINA (LUpus in MInorities: NAture versus nurture) study group who reported a higher cumulative incidence of lupus nephritis among non-white patients, with African Americans having a higher frequency than Hispanics residing in Texas [5], but permanent organ damage accrued more rapidly in these Hispanic patients [6]. Poverty, rather than ethnicity, has been strongly associated with mortality in multivariable analyses carried out over the life of the cohort [7, 8].

We have examined the socio-economic and -demographic characteristics, clinical and behavioural characteristics of two SLE Hispanic populations, one residing in the USA and the other in Mexico. We hypothesized that despite sharing a common ancestry, there will be some differences in disease expression probably related to differences in access to care and other barriers associated with immigration.

Patients and methods

Patients

The study population comprised two separate groups of Hispanic patients who were part of two different longitudinal studies carried out in the USA (the LUMINA study) and in Mexico (participating centre of the SLICC study group). LUMINA patients (one or two per each Mexican patient) were randomly chosen to match the total disease duration with the Mexican patients. Study methodology for both cohorts is detailed below.

LUMINA is a multi-centre, multi-ethnic longitudinal SLE outcome study that started in 1993. Eligible patients are of defined ethnicity (African American, Caucasian and Hispanic), $\geqslant 16$ years of age and $\leqslant 5$ years of disease duration at study entry and fulfil four or more of the ACR SLE classification criteria [9]. LUMINA patients reside within the catchment area of participating institutions (the University of Alabama at Birmingham, the University of Texas Health Science Center at Houston and the University of Puerto Rico Medical Sciences Campus). The LUMINA study follows two different Hispanic populations: Hispanics residing in/native of Texas (Texan Hispanics) and Puerto Rico. For the present analyses only the Texan patients were studied. Over 95% of the Texan Hispanics in LUMINA are of Mexican descent. Moreover, the large majority are immigrants (recent or within a few years) with almost none having been US-born.

As previously described [10, 11], patient eligibility was confirmed prior to enrolment through the review of available medical records. Clinical characterization of the disease at diagnosis (T_D)

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was obtained from the review of medical records at the recruitment visit (T_0). Follow-up visits were held every 6 months during the first year ($T_{0.5}$ and T_1), and yearly thereafter (T_2, T_3, etc.) until the last available visit (T_L). At T_0 and each subsequent visit, patients were interviewed by a study physician, and a physical examination and laboratory tests were performed. A complementary review of all available medical records was also performed to document clinical information for the interval preceding the study visit. Clinical information of missed study visits was completed through review of medical records.

The comparative group was from a separate longitudinal study of outcome [12] from a tertiary public care centre in Mexico City [Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán (INCMNSZ), a well-recognized institution whose reputation for quality of care is comparable with that of US institutions], which started recruitment in October 1999. Eligible patients for the INCMNSZ cohort are of $\geqslant$16 years of age, fulfil four or more ACR criteria for SLE, have $\leqslant$1 year of disease duration when recruited and are followed at least once in a year by two investigators at the INCMNSZ's Department of Immunology and Rheumatology. Comparative data for the Mexican patients were obtained by a US-trained investigator who had previously participated in data collection for the LUMINA cohort; data from the Mexican patients were obtained cross-sectionally using the same methodology that was used to obtain the Texan patients' information. Although the Spanish study forms had previously been translated and back-translated for the purpose of this study, their adequacy was pilot tested in 20 Mexican individuals of mixed gender and educational level before being used in the study. The Spanish study forms were well accepted and no modifications were required. The Institutional Review Board of each centre approved the study, and written informed consent was obtained from all participating patients in accordance with the Declaration of Helsinki.

Variables

Analyses included these variables matching those in the LUMINA database. Only variables included in these analyses will be described. Studied socio-economic and -demographic variables were age at T_D and T_L, gender, educational level, health insurance, home ownership and marital status.

Clinical features included disease duration, defined as the time elapsed between T_D (time when the ACR criteria were fulfilled) and T_L; disease activity ascertained at T_D and T_L with the SLAM-Revised (SLAM-R) [13] and through physician and patient global estimation of lupus activity by using 10-cm visual analogue scales (VAS), where zero corresponds to inactive disease and 10 is the worst active disease possible; damage accrual was ascertained with the SLICC/ACR Damage Index (SDI) [14] at T_0 and T_L; number of ACR criteria accrued at T_L; cumulative ACR criteria manifestations and arterial or venous thrombotic events; renal involvement defined as WHO Class II–V and/or proteinuria (>0.5 g/24 h or 3+) attributable to SLE and/or abnormal urinary sediment, proteinuria 2+ and elevated serum creatinine/decreased creatinine clearance twice, 6 months apart [5]; serology results available in the medical records were recorded. Drug utilization throughout the disease course [use and average dose of glucocorticoids, use of anti-malarials (HCQ or chloroquine), cyclophosphamide and other immunosuppressive drugs] were studied as well.

Behavioural and psychological variables included in this study were unhealthy behaviours (smoking, alcohol consumption, not exercising and use of recreational drugs) and social support. These variables were self-reported and recorded in a dichotomous manner (present and absent) either currently or in the past, except for social support that was assessed with the Interpersonal Support Evaluation List (ISEL) [15] in which higher scores indicate more adequate social support. Health-related quality of life was assessed with the Short Form-36 (SF-36) physical and mental component summary (PCS and MCS, respectively) measurements [16].

Statistical analyses

Because of the age differences (at diagnosis and at T_L) between the two Hispanic groups, all bivariate analyses were adjusted for age using linear and logistic regression, as appropriate. Multivariable analyses for disease activity, damage accrual and thrombotic events, adjusting for pertinent variables, were also performed. Variables with a P-value of $\leqslant$0.05 were considered as statistically significant in all the analyses.

Results

We identified 118 Texan and 112 Mexican patients. Only 70 Mexican patients could be successfully matched with one or two Texan patients; for 46 Mexican patients only one match was found, whereas for 24 patients two matches were identified for a total of 94 Texan patients. Mean total follow-up time for both groups was 4 (3.1) years. The clinical characteristics of matched and unmatched patients were similar.

Socio-demographic, behavioural and psychosocial features

As expected, the vast majority of the patients in both groups were women (92.7%). Mexican patients were significantly younger than the Texan patients. In age-adjusted analyses, the Mexican patients were more educated than the Texan patients. Since the INCMNSZ is a public institution that is primarily open for patients who are not covered through government health insurance institutions, the great majority of the Mexican patients did not have health insurance coverage, in contrast to almost half of the Texan patients who had health insurance. A similar proportion of patients in the two groups owned their homes, but the differences were significant in favour of the Texan patients in the adjusted analyses. There were no differences in the proportion of patients who are currently exercising, smoking or consuming alcohol or recreational drugs between the two groups. There were no differences in the level of social support reported by patients in both the groups. Mexican patients scored significantly higher in both the SF-36 PCS and MCS. These data are shown in Table 1.

Clinical features. These data are depicted in Table 2. In terms of cumulative SLE-related manifestations, serosal and renal involvement was significantly more common in the Texan patients as compared with the Mexican patients. In contrast, there were no differences in mucocutaneous, musculoskeletal, pulmonary, neurological and haematological involvement. Interestingly,

TABLE 1. Socio-economic and -demographic characteristics, behavioural and psychosocial features of Hispanic lupus patients residing in the USA and Mexico at last visit[a]

Variable	USA, $n=94$	Mexico, $n=70$	P-value*
Gender, female, %	94	91	
Age at diagnosis, mean ± S.D., years	32.4 ± 11.7	25.8 ± 8.5	<0.001
Age at last visit, mean ± S.D., years	37.1 ± 12.8	29.1 ± 8.5	<0.0001
Education, mean ± S.D., years	10.9 ± 3.4	12.8 ± 3.4	0.0062
Married/living together, %	53	29	
Has health insurance, %	45.5	8.7	<0.0001
Home ownership, %	51.2	48.8	0.0342
Exercising, %	37.7	43.6	
Drinking, %	9	7	
Smoking, %	12	17	
Use of recreational drugs, %	4	1	
SF-36 PCS, mean ± S.D.	36.8 ± 9.9	48 ± 8.7	<0.0001
SF-36 MCS, mean ± S.D.	40.2 ± 9.5	47.9 ± 9.4	<0.0001
ISEL, mean ± S.D.	7.5 ± 2	7.9 ± 1.3	

[a]Unless otherwise specified. *Only P-values $\leqslant$0.10 are noted; all comparisons are adjusted for age at diagnosis or last visit, as appropriate.

TABLE 2. Clinical features of Hispanic lupus patients residing in the USA and Mexico

Feature	USA, $n=94$	Mexico, $n=70$	*P*-value*
ACR criteria number at last visit, mean ± S.D.	5.6 ± 1.2	6.1 ± 1.7	
Cumulative organ system involvement, %			
Mucocutaneous	88	74	
Musculoskeletal	100	99	
Serosal	67	37	<0.0001
Pulmonary	10	4	
Neurological	13	9	
Renal	72	56	0.0009
Haematological	83	90	
Arterial/venous thrombosis	19	4	0.0715
Serology-positive results, ever, %			
ANAs	100	90	
Anti-dsDNA	78	86	
Anti-Sm	32	19	0.0128
Anti-Ro	21	24	
Anti-RNP	10	29	0.0054
aPL antibodies (IgG or IgM)	39	59	0.0729
LAC	13	3	0.0185
SLAM-R score at diagnosis, mean ± S.D.	12.9 ± 6.1	10.7 ± 6.3	0.0030
SLAM-R score at last visit, mean ± S.D.	9.2 ± 5.8	5.6 ± 2.8	<0.0001
Patient's global assessment at last visit, mean ± S.D.	3.2 ± 3	1.9 ± 2.2	0.0061
Physician's global assessment at last visit, mean ± S.D.	2 ± 2.2	1.5 ± 1.2	0.0079
SDI score at last visit, mean ± S.D.	1.1 ± 1.6	0.6 ± 1	0.0505

*Only *P*-values ⩽0.10 are noted; all comparisons are adjusted for age at diagnosis or last visit, as appropriate.

19% of the Texan patients experienced an arterial and/or venous thrombotic event compared with 4% in the Mexican group; however, these differences were not significant after adjusting for age ($P=0.0715$). In a multivariable model limited to women in which age and oral contraceptives (OCPs) and aspirin use were adjusted for, Texan Hispanic ethnicity was not significantly associated with thromboses (data not shown). Similar results were found when all patients were included in the multivariable model (excluding OCP use). Texan patients were more likely to have a positive LAC test during their disease course than the Mexican patients; likewise, antibodies to Sm were more common among Texan than Mexican patients. Conversely, the Mexican patients were more likely to have positive anti-RNP during their disease course.

Both the SLAM-R score and the patient and physician VAS were higher among the Texan patients as compared with the Mexican patients; this was true at T_D and at T_L. In the multivariable analysis adjusted for age, gender and ACR criteria number, Texan Hispanic ethnicity was significantly associated with disease activity at T_L ($P<0.00001$). These data are noted in Table 3.

Texan patients accumulated more damage than the Mexican patients; damage accrual in Texan Hispanics occurred only in the neurological domain, with no differences observed in the rest of the damage domains (data not shown). In a multivariable model, adjusted for age, gender and glucocorticoid use, Texan Hispanic ethnicity associated with damage accrual but statistical significance was not reached ($P=0.0527$). These data are also noted in Table 3.

The majority of the patients in both groups received glucocorticoids as part of their management; the maximum doses (prednisone or prednisone equivalent) were higher among the Mexican [50.2 (26.2) mg/day] than among the Texan patients [46 (26.8) mg/day], $P<0.0001$; whereas, the average dose was higher among the Texan [17.9 (15.6) mg/day] than among the Mexican patients [13.7 (12.3) mg/day]. Patients residing in Texas were three times more likely to receive i.v. cyclophosphamide throughout their disease course than patients residing in Mexico, although this difference was not statistically significant. Of interest, Mexican patients received AZA more commonly than Texan patients, and this difference was statistically significant

TABLE 3. Multivariable analyses of disease activity and damage accrual at last visit in Hispanic patients residing in the USA and Mexico

Independent variables	*t*-value	*P*-value
Dependent variable: SLAM-R		
Age	−2.76	0.0065
Hispanic Texan ethnicity	5.74	<0.0001
Female gender	0.57	0.5666
Criteria number	1.29	0.2004
Dependent variable: SDI		
Age	−0.10	0.9217
Hispanic Texan	1.95	0.0527
Female gender	0.27	0.7895
Glucocorticoids (ever)	0.21	0.8378

TABLE 4. Cumulative medication use by Hispanic lupus patients residing in the USA and Mexico

Feature	Texas, $n=94$	Mexico, $n=70$	*P*-value*
HCQ or chloroquine, %	83	67	0.0903
Glucocorticoids, %	95	94	
Intravenous glucocorticoids, %	20	21	
Glucocorticoids highest dose, mean ± S.D.	46 ± 26.8	50.2 ± 26.2	<0.0001
Glucocorticoids average dose, mean ± S.D.	17.9 ± 15.6	13.7 ± 12.3	0.0237
Intravenous cyclophosphamide, %	10	3	0.0750
AZA, %	19	73	<0.0001
MTX, %	16	24	
LEF, %	0	1	
Mycophenolate mofetil, %	10	3	0.0880
Cyclosporin, %	3	0	
Aspirin, %	14	63	<0.0001
NSAIDs, %	55	60	
ACE inhibitors, %	43	47	<0.0001
Anti-depressants, %	22	19	
Statins, %	7	19	0.0113
Bisphosphonates, %	11	0	
OCPs	19	28	

*Only *P*-values <0.10 are shown; all comparisons are adjusted for age at the last visit.

($P<0.0001$). Similarly, Mexican patients were exposed less frequently to anti-malarial drugs, but the difference did not reach statistical significance. Other immunosuppressive drugs were used at a similar rate by the patients in both groups. Mexican patients were more likely to have ever used aspirin, angiotensin converting enzyme (ACE) inhibitors and statins as part of their treatment as compared with Texan patients. There were no differences in the use of NSAIDs, anti-depressants or bisphosphonates between the groups. These data are shown in Table 4.

Discussion

This study has shown striking differences in SLE clinical features and levels of disease activity between Hispanic patients residing in Texas, largely of Mexican origin, and patients who live in Mexico. Texan Hispanics had higher levels of disease activity both at diagnosis and at last available visit (with more frequent serosal and renal involvement). Because of the age difference between both the patient groups, all analyses were adjusted for age; of note, the age difference was also observed when the unmatched Mexican and Texan patients were compared (31.4 *vs* 26.0 years; $P=0.0002$) suggesting that in fact SLE may occur at an earlier age in Hispanic patients residing in Mexico than in those who had emigrated. This younger age of onset in non-industrialized societies has been observed for other chronic diseases [17].

The LUMINA study has consistently shown worse outcomes in African Americans and Texan Hispanics as compared with Caucasians and Puerto Rican Hispanics. More specific comparisons have also been done by the LUMINA group, showing more

severe disease in Hispanic American patients than those found in Hispanic patients residing in other geographic locations, such as Spain and Puerto Rico [18, 19]. These findings could be explained by genetic admixture, particular characteristics of the geographic place of residence (e.g. intensity of ultraviolet light) or socio-economic factors that clearly differ between various Hispanic sub-populations.

Of the 1214 Hispanic SLE patients included in the Latin American Group for the Study of Lupus (GLADEL) cohort, significant differences were found between them in socio-economic characteristics, type of care and educational level favouring those of European ancestry. Mestizo and African Latin American patients were younger at disease onset, and developed renal disease and lymphopenia more frequently. The GLADEL investigators concluded that 'Hispanic' patients actually constitute a markedly heterogeneous group of subjects [20].

Socio-economic status has a very significant impact on chronic disease outcomes, and SLE is not the exception [21–23]. The Mexican Hispanics studied had a higher educational level than the US Hispanic patients. Educational level in our Mexican Hispanics was comparable with that reported in a different Mexican SLE cohort by Zonana-Nacach *et al*. [24], but higher than those in the Mexican patients participating in the GLADEL cohort (personal communication from Dr Bernardo Pons-Estel, lead GLADEL investigator, Rosario, Argentina). Conversely, other proxy measures of socio-economic status favoured the Texan patients (health insurance and homeownership). Uninsured patients in both Mexico and the USA had access to care via publicly funded institutions where care is provided at low cost. It should be noted, however, that we could not perform head-to-head comparisons of either income or poverty status; these indicators need to be judged in the proper context before concluding that socio-economic status is better in one group than in the other, given the differences in the cost of living in the USA and Mexico. Moreover, a higher educational status in the Mexican patients does not necessarily portend a better socio-economic status, since it is not uncommon in Mexico, even for professionals, to be working at occupations for which they are overeducated. Finally, as opposed to the Mexican patients, some degree of discrimination may have been experienced by the Texan patients who may have negatively impacted on their disease course and outcome [25]; unfortunately, such construct was not ascertained in our patients.

Clinical differences were higher disease activity both at diagnosis and T_L and damage in the US Hispanics as compared with their Mexican counterparts. In multivariable analyses, after adjusting for pertinent variables, Texan Hispanic ethnicity was significantly associated with disease activity. The clinical characteristics of the Mexican Hispanics are very similar to those found in a study of SLE patients with acute severe SLE in a tertiary centre in Mexico City [24]; these investigators found a mean $\pm$ S.D. number of SLE ACR criteria of 6.5 ± 1.5, cutaneous involvement was present in 71%, articular in 66%, renal in 58%, neuropsychiatric in 12% and positive ANA, anti-DNA and anti-Sm in 92, 85 and 17% of the patients, respectively. As expected, these patients had higher SLAM and SDI scores than patients in our cohorts. Reports on damage accrual in other Mexican cohorts have found damage scores similar to those of our Texan Hispanic patients; however, these cohorts have longer disease duration as compared with our patients, which makes their data less comparable with that of ours [25–27]. In those studies, musculoskeletal damage and gonadal failure were found more frequently than in our patients. Data on other Hispanic US populations are limited. Similar outcomes have been reported in Hispanic patients from Florida (mainly of Cuban and South American origin) and from New York (of more diverse background) [28, 29].

Although no significant differences were observed between Texan and Mexican Hispanic patients regarding the frequency of neurological manifestations, it is worth to note that their relatively low frequency may relate to the fact that only seizures and psychosis were assessed in this study rather than the full spectrum of the neuropsychiatric manifestations recognized by the ACR [30]. It is worth pointing out that the LUMINA study antecedes the development of these classification criteria.

Worthy of mention are the differences noted in SF-36 health-related quality of life measurements. Both the PCS and MSC scores were significantly higher among Mexican Hispanic patients as compared with the Texan Hispanics. However, comparison of our data is difficult because of the limited number of publications available (particularly in Hispanic SLE patients) and the diversity of quality of life indicators provided. We have previously reported the SF-36 scores at T_L for the LUMINA cohort [31], with no significant differences between the PCS and MCS scores between Hispanic patients from Texas and Puerto Rico (although the MCS scores observed in the current study were somewhat lower than the ones previously reported for Texan Hispanic patients). Both summary measures were lower among our Mexican and Texan Hispanic SLE patients than in healthy Hispanic individuals living in Mexico and the USA, respectively [32, 33]. Both scores were lower in our Texas Hispanic lupus patients than those found in Hispanic Americans with other rheumatic diseases and diabetes [34, 35]; in contrast, our Mexican Hispanic patients' scores were comparable with those of Mexican patients with other diseases (including other rheumatic entities) [36, 37].

Of interest were the differences in treatment regimens used between these two cohorts: a higher proportion of patients in the Mexican group were treated with AZA, as compared with the Texan Hispanic patients who were more likely to receive cyclophosphamide. Treatment differences could be explained by differences in the calendar year in which patients entered their respective cohorts and differences in practice patterns (including availability and cost of some compounds) between different institutions/physicians, or by higher levels of disease activity among the Texan Hispanics.

These analyses bring to mind the health disparities that immigrant populations confront in their adopted country, driven in part by immigration status, and cultural and linguistic differences [38]. The study of health outcomes in immigrant populations has gained great relevance, since immigration has become a global phenomenon. In the USA, it has been estimated that the Hispanic population will nearly triple during the 2008–50 period [1]. Hispanic patients in the USA present overall worse health outcomes in a large group of diseases, including SLE; studies have suggested that these differences may be related to socio-economic factors [28, 29] or exposure to a distinct environment, although some of these differences may also be explained by biological or genetic factors [39]. Unfortunately, we do not have precise data about the genetic background of the Mexican patients studied, albeit it is likely that they exhibit a smaller proportion of Amerindian genes than our Texan Hispanic patients [40, 41]. Interestingly, UV indices in Mexico City and Houston appear to be comparable (fluctuating around 10 during the summer months) [42]. As to the socio-economic factors, and as already noted, there were no striking differences between the two groups; this does not rule out the presence of other factors that may make the life of the immigrant, overall, harder than the one of the non-immigrant, such as discrimination. Language barriers and overt/subtle discrimination may be the factors contributing to difficulties with access to care among immigrants. A higher prevalence and worse outcomes have been described on immigrant patients from different ethnic origins in other countries [43–46].

Our study has some limitations. First, both cohorts were followed as part of two different studies (the LUMINA study and the SLICC registry for atherosclerosis); in order to obtain comparable data, the Mexican cohort was assessed at one time point only by a LUMINA-trained investigator following the same protocol and its data collection forms. Second, the differences seen in these analyses may be explained by differences in socio-

economic status and access to health care, but our data failed to demonstrate that. Moreover, and as already noted, a genetic comparison between the two cohorts was not available to conclusively exclude biological factors. The INCMNSZ is a tertiary care centre which follows patients who live mainly in the central states of Mexico including the Metropolitan Area of Mexico City, a region that, between 1950 and 1980, received the highest percentage of internal migration from 19 of the 31 Mexican states [47]; this would increase the possibilities of matching the diverse composition of immigrant groups in the southern US states but does not assure that. Third, the Mexican patients were recruited from a single institution and may not represent the entire SLE population in Mexico. Patients living in rural areas and those with limited access to medical care may have higher disease activity and more damage than the patients we studied. Fourth, the sample size included in these analyses was relatively small; ~30% of the original sample was excluded because we were unable to match all available patients. However, the clinical characteristics of patients matched and unmatched were comparable.

In summary, Texan Hispanic SLE patients have a more severe disease than the Hispanic patients living in Mexico. Rheumatologists need to be aware of the higher disease burden this immigrant population experience and proceed accordingly to minimize it.

Rheumatology key messages

- Mexican SLE patients living in Mexico have less severe disease than those in the USA.
- Rheumatologists should be aware of the course and outcome of SLE in immigrant populations.

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