CHILDHOOD-ONSET SYSTEMIC LUPUS ERYTHEMATOSUS: A COMPARATIVE STUDY OF AFRICAN AMERICANS AND LATIN AMERICANS

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This study compared the clinical and serologic features in two different ethnic groups of patients with childhood-onset systemic lupus erythematosus (SLE). One hundred seventy-one SLE patients comprised the study population; 61 (55 girls and 6 boys) were African American with age at onset of 13±2.9 years, and 110 (97 girls and 13 boys) were Latin American (Colombian) with age at onset of 13±3.2 years. Clinical, demographic, and laboratory data were obtained by chart review using a standard data collection form.

African-American patients more commonly manifested discoid skin lesions, malar rash, pulmonary fibrosis, and pleuritis, and less commonly manifested photosensitivity, livedo reticularis, and vascular thrombosis than did Latin Americans. In addition, there was a higher frequency of anti-dsDNA, anti-Sm, anti-RNP, and anti-Ro positivity among African-Americans compared with Latin-American patients. These results suggest the presence of ethnic differences in the clinical expression of SLE. (*J Natl Med Assoc.* 1999;91:497-501.)

Key words: systemic lupus erythematosus ◆ African Americans ◆ Latin Americans

Systemic lupus erythematosus (SLE) is a multisystem organ disease of unknown etiology. Systemic lupus erythematosus is a clinically heterogeneous autoimmune disease in which environmental, genetic, and ethnic factors play important roles. Interestingly, ethnic differences in SLE do exist.[1-4] African-American patients with SLE may differ from white patients with SLE. However, these findings have not been entirely explored in relation to other populations such as Latin Americans. In addition, most of these studies have involved adults with SLE,[5-9] with little emphasis on childhood-onset SLE.[10]

This study compared the clinical and serologic features of SLE in African-American and Latin-American childhood patients from two different geographic locations.

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MATERIALS AND METHODS

Patient Population

This study was a cross-sectional, comparative, multicenter, and binational analysis of two different ethnic groups of patients with childhood-onset SLE (onset of disease <17 years). Sixty-one (55 girls and 6

Table 1. Demographic Characteristics

	No. (%) African Americans (n=61)	No. (%) Latin Americans (n=110)	*P* Value
Sex			
Females	55 (90)	97 (88)	NS
Males	6 (10)	13 (12)	NS
Female:male ratio	9:1	7:1	
Age at onset (yr)	13±2.9	13±3.2	NS
Range	5-17	4-17	
Disease duration (yr)	5.7±5.9	7.6±5.4	.04

NS=not significant.

boys) African Americans with age at onset of 13±2.9 years and 110 (97 girls and 13 boys) Latin Americans (Colombian) with age at onset of 13±3.2 years comprised the study group. African-American patients were recruited from the LSU Medical Center and Children's Hospital, New Orleans, LA and included all African-American children with SLE seen between July 1994 and June 1996. Latin-American patients were recruited from the University Hospital, San Vicente de Paul, Medellin, and Clinica Infantil Colsubsidio, Bogota Colombia and included all children with SLE seen between July 1994 and June 1996. All patients fulfilled four or more of the revised American College of Rheumatology (ACR) criteria for the classification of SLE.[11]

Patient demographics and data on cumulative clinical and laboratory manifestations over the course of follow-up were obtained either by chart review or verification during discussion with the patient. Demographic information included patient sex, race, date of birth, and age at onset of the disease, defined as the age when the initial manifestation was clearly attributable to SLE.

Definition of Clinical and Laboratory Features

The clinical and laboratory variables associated with SLE, including each feature of the revised ACR criteria, were evaluated. Clinical and serologic findings were recorded as present or absent for each patient at any time in the course of the disease. Clinical manifestations included:

- arthritis (nonerosive arthritis involving two or more peripheral joints, characterized by tenderness, swelling, or effusion,
- malar rash,
- photosensitivity,
- alopecia,
- discoid lupus,
- livedo reticularis,
- Raynaud's phenomenon,
- renal involvement (as evidenced by a positive renal biopsy result, an active urinary sediment, or proteinuria >500 mg/24 hours),
- nephrotic syndrome (defined as >3 g of proteinuria in a 24-hour specimen) or the presence of proteinuria (3+ to 4+) in urinalysis with a serum albumin level <2.8 g/dL,
- neurologic involvement (seizures without other definable cause, psychosis without other definable cause, or other conditions such as peripheral neuropathy, stroke, transverse myelitis, chorea, or other central nervous system lesions directly attributable to SLE in the absence of other causes),
- pleuritis (pleural friction rub, effusion, or typical pleuritic pain),
- pulmonary fibrosis,
- pericarditis (documented by pericardial friction rub or evidence of pericardial effusion by echocardiogram),
- autoimmune hemolytic anemia, with hematocrit <35% and reticulocyte count >4%,
- leukopenia (white cells <4000/mm^3),
- thrombocytopenia (platelets <100,000/mm^3),
- lymphadenopathy or splenomegaly, and
- arterial or venous thrombosis diagnosed on clinical grounds and confirmed by complementary tests.

Serologic Studies

Antinuclear antibodies (ANA) were determined by indirect immunofluorescence using HEp-2 cells

Table 2. Clinical Manifestations

	No. (%) African Americans (n=61)	No. (%) Latin Americans (n=110)	*P* Value
Skin involvement	51 (84)	89 (81)	NS
Malar rash	42 (69)	57 (52)	.03
Discoid lupus	13 (21)	10 (9)	.03
Photosensitivity	12 (20)	62 (56)	<.0001
Alopecia	26 (43)	64 (58)	NS
Arthritis	48 (79)	83 (75)	NS
Raynaud's phenomenon	10 (16)	33 (30)	NS
Renal involvement	27 (44)	61 (55)	NS
Neurologic involvement	19 (31)	44 (40)	NS
Seizures	13 (21)	26 (24)	NS
Psychosis	6 (10)	11 (10)	NS
Pleuritis	22 (36)	26 (24)	NS
Pericarditis	17 (28)	18 (16)	NS
Pulmonary fibrosis	6 (10)	1 (1)	.008
Livedo reticularis	0	13 (12)	.004
Vascular thrombosis	1 (2)	6 (6)	NS
Lymphadenopathy	16 (26)	35 (32)	NS
Splenomegaly	4 (7)	13 (12)	NS
Hemolytic anemia	11 (18)	13 (12)	NS
Leukopenia	28 (46)	60 (55)	NS
Thrombocytopenia	16 (26)	24 (22)	NS

NS=not significant.

as substrate. Anti-dsDNA antibodies were determined by indirect immunofluorescence with *Crithidia luciliae* as substrate. Precipitating antibodies to extractable nuclear antigens (ENA), including Sm, U1-RNP, Ro/SSA, and La/SSB, were detected by double immunodiffusion. C3 and C4 were measured by precipitation, and anti-cardiolipin antibodies of IgG, IgM, and IgA isotypes were measured by ELISA as described by Gharavi et al.[12]

Statistical Analysis

Descriptive statistics were performed and differences between means and proportions were established by using the Student's *t* test, χ^2, and Fisher's exact test as appropriate. A *P* value <.05 was considered statistically significant.

RESULTS

Patient Characteristics

Table 1 lists the demographic characteristics of the 171 SLE patients studied. While patients were similar in terms of sex distribution and age, disease duration was longer in the Latin-American group.

Clinical Manifestations

Table 2 summarizes the prevalence of the main clinical findings observed in the patients at any time during the course of the disease. The most common organ involved in both groups was the skin, followed by the joints and the kidney. Skin involvement occurred with similar frequency in both groups; however, the prevalence of discoid lupus lesions (21% versus 9%) and malar rash (69% versus 52%) was much higher in African Americans than among Latin Americans, while photosensitivity (56% versus 20%) and livedo reticularis (12% versus 0%) were seen more frequently in Latin Americans. African Americans also had a higher prevalence of pulmonary fibrosis (10% versus 1%). These differences where statistically significant.

Other major manifestations of the disease (including renal disease, neurologic involvement, serositis, blood disorder, and Raynaud's phenomenon) occurred with similar frequency in both groups. In regard to renal involvement, the prevalence of nephrotic range proteinuria (26% in African Americans and 25% in Latin Americans) and end-

Table 3. Serologic Findings

	No. (%) African Americans (n=61)	No. (%) Latin Americans (n=110)	*P* Value
ANA	61/61 (100)	106/110 (96)	NS
Anti-dsDNA	55/59 (93)	58/75 (77)	.0003
Anti-Sm	28/52 (54)	12/43 (28)	.01
Anti-RNP	32/52 (62)	10/28 (36)	.03
Anti-Ro/SSA	34/53 (64)	16/42 (38)	.01
Anti-La/SSB	12/50 (24)	10/42 (24)	NS
Low C3	43/52 (83)	71/83 (86)	NS
Low C4	43/52 (83)	76/84 (90)	NS
aCL (any isotype)	9/30 (30)	15/35 (43)	NS
IgG aCL	8/30 (27)	15/35 (43)	NS
IgM aCL	0/30 (0)	9/35 (26)	.002
IgA aCL	3/19 (16)	0/17 (0)	NS
Rheumatoid factor	15/60 (25)	15/72 (21)	NS
VDRL	9/56 (16)	15/69 (21)	NS

NS=not significant.

Table 4. Ethnic Differences in Clinical and Serologic Features of Systemic Lupus Erythematosus Patients

Study	Population	African Americans	Whites
Hochberg et al[5]	Adults	Renal disease, lupus pneumonitis, discoid lupus, decreased C_3, hyperglobulinemia	Photosensitivity
Ward and Studenski[7]	Adults	Renal disease, discoid lupus, psychosis, serositis, anti-Sm, RNP	Photosensitivity
Petri et al[8]	Adults	Renal disease, anti-Sm, anti-RNP	Photosensitivity, malar rash
Ballou et al[10]	Adults and pediatric	Serositis	Hemocytopenia
Arnett et al[13]	?*	Anti-Sm, anti-RNP	—
Gulko et al[14]	Adults and pediatric	Anti-Sm, anti-RNP	—
Barron et al[15]	Pediatric	Anti-Sm, anti-RNP	—
Study	**Population**	**African Americans**	**Latin Americans**
Gedalia et al†	Pediatric	Discoid lupus, malar rash, lupus neumonitis, anti-DNA, anti-Sm, anti-RNP, anti-Ro	Photosensitivity, livedo reticularis

*?=not provided.
†Present study.

stage renal disease (10% in African Americans and 12% in Latin Americans) was similar in both groups. Vascular thrombosis was infrequent, occurring in only one African-American and six Latin-American patients. Stroke occurred in 3% of African-American and 5% of Latin-American SLE patients. Positive family history for SLE was present in 8% in Latin Americans and 13% in African Americans.

Serologic Findings

Table 3 lists the serologic findings for both groups. The prevalence of anti-dsDNA (93% versus 77%), anti-Sm (54% versus 28%), anti-RNP (62% versus 36%), and anti-Ro/SSA (64% versus 38%) antibodies was higher in African Americans than Latin Americans. These differences were statistically significant. Although the prevalence of aCL anti-

bodies tended to be higher in the Latin-American group, the differences did not reach statistical significance except for the IgM isotype, which was not detected in any of the 30 African-American patients tested for this isotype. Reduced levels of serum complement (83% in African Americans and 88% in Latin Americans) and the presence of rheumatoid factor (25% in African Americans and 21% in Latin Americans) and VDRL (16% in African Americans and 21% in Latin Americans) was detected with similar frequency in both groups.

DISCUSSION

It is well known that the clinical spectrum of SLE may vary according to different ethnic groups studied. However, most of these studies have involved only patients with adult-onset SLE (Table 4). This study compared the clinical and serologic features of this disease in two large pediatric populations of ethnically distinct patients from two different geographic locations. All patients underwent follow-up at university medical centers and were comparable in terms of age and sex distribution. In agreement with most studies involving adult-onset SLE,[5-9] African-American patients had a higher prevalence of discoid lupus and pulmonary fibrosis, and a lower prevalence of photosensitivity and livedo reticularis than Latin-American patients. A higher prevalence of malar rash also was noted in African-American compared with Latin-American patients.

As has been shown previously,[5-8,12-15] both in adults and children with SLE, anti-Sm and anti-RNP antibodies were found more frequently in the African-American patients in this study. However, a significantly higher frequency of anti-dsDNA and anti-Ro/SS-A antibodies were found in African-American patients, a finding that has not been reported previously. These patients with anti-Ro/SSA antibodies are at higher risk for the development of cardiac involvement, as was suggested in a another recent study performed on the same patient population.[16]

CONCLUSION

Inter-ethnic differences in the clinical expression of SLE may be explained by the presence of genetic, socioeconomic, and environmental factors. This study confirms the existence of ethnic (African American and Latin American) differences in the clinical and serologic features of SLE in children. Further studies are needed to evaluate the same clinical and serologic features of SLE in a pediatric white population compared with African-American and Latin-American pediatric populations.

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