Original Article

Initial Presentation of SLE among the Different South African Ethnic Groups

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ABSTRACT

Background: Systemic lupus erythematosus (SLE) is a chronic, immune-mediated, inflammatory multi-organ disease. It is characterized by a variety of clinical features including abnormalities of the joints, skin, kidneys, lungs, heart, blood and brain. In addition to gender, genetic, environmental, hormonal and chemical factors appear to play a role in disease activity. Previous studies in South Africa have shown an increasing trend of new diagnoses of SLE patients, with increasing target organ damage but there is an obvious distinction between different organs in terms of incidence. The primary aim of this study was to identify the major initial presentation of SLE patients among the three main South African ethnic groups: Black, Mixed ethnicity, and White.

Material and Methods: This was a retrospective descriptive and analytic study in which patients with SLE were compared among the three ethnic groups in South Africa. Data was obtained from patient’s records contained in the Enterprise Content Management System (ECM) and medical records.

Results: A total of 198 patients were seen in the Rheumatology Division with SLE between March 1993 and November 1999. The study showed that the most affected group was the mixed ethnicity population (81.4%), followed by the black African group (11.6%), then the white group (7%). Arthritis was the most frequent disorders among the three different ethnic groups. However, there appear to be some differences in the autoantibody profile.

Conclusion: This study focused on the initial presenting symptoms. A long-term cohort on the development of the disease may yield further results on possible ethnic differences, and continued research into susceptibility loci and phenotypic associations in enriched multi-ethnic cohorts and looking for the causes of death among the three ethnic groups and related to the first presentation is suggested.

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Introduction

The systemic lupus erythematosus (SLE) is a syndrome of unknown etiology most commonly affecting young women, virtually any organ of the body can be involved. Ethnicity, as opposed to race, is both, a biological and a social construct; it encompasses ancestral genes and cultural, geographic and socioeconomic characteristics shared within a population. Of course, it is possible that in some patients the biologic component of ethnicity, rather than its socioeconomic component, maybe the most important.1 Health Disparities denote differences in the incidence, prevalence, mortality, and burden of disease and other health conditions that exist among distinct population groups.2

South Africa does not constitute a homogeneous population concerning geography, ethnicity, environmental factors, or socio-economic conditions. SLE has not been researched in South Africa to anywhere near the same extent in developing countries as in the industrialized world. Hence, while many of the reported differences probably reflect true biological differences due to a combination of genetic, environmental and socioeconomic factors, at least some of the apparent differences are simply a reflection of lack of good research data on SLE in the developing world.

In a study done at Bloemfontein in South Africa, data were obtained from 76 patients: Black African patients accounted for 61.3% of the study population, whites for 33.9%, Asians for 1.6% and mixed ethnicity for 3.2%. Patients most frequently had immunological (90.8%), mucocutaneous (86.9%), musculoskeletal (85.5%) and cardiovascular problems (77.6%).3 In other study, a data were collected from 408 South Africans. Indians represented (58.1%) of the patients, while Blacks African (33.6%), Mixed ethnicity (4.2%) and Whites only (4.2%). The most common manifestations were arthritis (80.6%), and photosensitivity (67.2%), while anti-nuclear factor was positive in (96.8%). The independent predictors of death were renal involvement, anti-dsDNA antibodies and seizures, with no differences related to ethnicity or age of onset.4

The purpose of the study is to compare the initial presentation of SLE patients among the three main South African ethnic groups: African black, mixed ethnicity, and White.

Material and Methods:

This is a retrospective descriptive and analytic study in which patients with SLE were compared among the three ethnic groups in South Africa. Data on gender and age at disease onset were collected for each patient from patient records. Ethical approval for this retrospective analysis was applied to the Stellenbosch University Research Ethics Committee. All data was collected and stored in a database (password protected) with access limited only to the principal investigator.

Statistical analysis

Data were analyzed for gender, mean age, ethnicity and frequency of the first clinical presentation among the different ethnic
groups. As we were interested in the association between the outcome variables and the ethnic group, so we used tab odds command in Stata to tabulate the odds of these variables against race. The p-values for the test of homogeneity were reported here to assess if the odds differ by race. A few of the variables lacked results, mainly because only zeros were recorded (indicating data not available). A Pearson’s chi-square test was also performed to support the findings from the homogeneity test. A binary logistic regression model was fitted for the variables which showed an association with race.

Table 1: Demographic data of SLE patients

<table>
<thead>
<tr>
<th>Race</th>
<th>Number of patients</th>
<th>Mean age</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>23</td>
<td>28 years</td>
<td>27 (21 – 36)</td>
</tr>
<tr>
<td>Mixed ethnicity</td>
<td>161</td>
<td>28.58 years</td>
<td>27 (19 – 34)</td>
</tr>
<tr>
<td>White</td>
<td>14</td>
<td>26.43 years</td>
<td>25 (15 – 30)</td>
</tr>
</tbody>
</table>

Clinical manifestations at first presentation:

The clinical manifestation of SLE at first presentation to the hospital included malar rash (126/198), photosensitivity (76/198), discoid rash (49/198), oral ulcer (32/198), arthritis (143/198), serositis (54/198), proteinuria (66/198), casts (24/198), seizures (22/198), psychosis (13/198), anemia (32/198), neutropenia (26/198) lymphopenia (69/198), thrombocytopenia (33/198), antinuclear antibodies (174/198), anti-DNA (124/198), anti-Sm (56/198), anticientromere antibodies (27/198).

1-Skin disorders at first presentation among the different ethnic groups:

Skin disorders such as malar rash, discoid rash, photosensitivity, and oral ulcers were observed at the first presentation of SLE patients among the different groups. (Fig.1) Malar rash was the most observed clinical skin disorder at first presentation in all SLE patients (63%), while photosensitivity was noted in (38.8%) of all SLE patients. Discoid rash and oral ulcers were less frequently observed (24.7% and 16.1% respectively). Regarding malar rash, (70%) of the mixed ethnicity patients had a rash at first presentation, compared to (34.7%) of the African black patients and 64.2%) of the white patients. On the other hand, photosensitivity was seen more frequently in (64.2%) white patients, and (41.6%) of the

Study population:

A total of 198 patients were seen in the Rheumatology Division with SLE between March 1993 and November 1999. Of these, 180 patients were female, while 18 patients were male. The demographic data of patients with SLE are depicted in Table 1.
mixed ethnicity patients, while it was not observed in African black patients. The discoid rash was found most frequently in African black patients (52.7%) and less frequently in mixed ethnicity patients (22.3%) and only one white patient (7.1%). The oral ulcer was seen in (21.4%) of the white patients, (16.77%) of the mixed ethnicity patients and (8.75%) of the African black patients.

Fig 1: Skin disorders at first presentation among the different racial group

1. **Arthritis at first presentation among the different ethnic groups:**

Of all SLE patients, arthritis was one of the most common clinical presentations, which was noticed in 72.2% of all SLE patients. The most frequently affected group was white patients (85.7%), followed by mixed ethnicity patients (71.43%) and then African black patients (69.57%). Serositis was seen less frequently than arthritis and was mainly noted in mixed ethnicity patients (29.19%) compared to African black patients (21.74%), and white patients (2 out of 14-14.29%).
Fig 2: Arthritis and serositis at first presentation among the different racial group

2. **Renal disorders at first presentation among the different ethnic groups:**

The statistical analysis resulted in a total of 45.4% of patients with renal abnormalities at their first presentation among the different South African groups. (Fig 3). Proteinuria and hematuria were more observed than renal casts (33.3% versus 12.1% patients). Among patients who had proteinuria, African black patients were more affected (52.17%), followed by mixed ethnicity patients (31.87%), and then white patients (21.43%). The renal cast was seen in (14.37%) of mixed ethnicity patients and one African black patient (4.35%), while no renal cast was observed in white patients.

![Bar chart showing renal disorders](chart.png)

Fig 3: Renal disorders at first presentation among the different racial group

**Neurological disorders at first presentation among the different ethnic groups:**

Seizures were noted in 11.1% of all SLE patients at first presentation. 13.04% of the mixed ethnicity patients presented with seizures at first presentation, while only one white patient (7.14%) had seizures and none of the African black patients developed seizures at first presentation. On the other hand, psychosis was observed in 6.5% of all SLE patients at first presentation. Of those, psychosis was seen in 11 out of 161 (6.87%) of mixed ethnicity patients and in only one African black (4.35%) as well as one white patient (7.14%).
Fig 4: Neurological disorders at first presentation among the different racial group

3. **Hematological disorders at first presentation among the different ethnic groups:**

The results showed different hematological disorders at first presentation of SLE patients such as anemia (16.1%), leukopenia (13.1%) lymphopenia (34.8%), and thrombocytopenia (15.6%). Anemia was seen in (74%) of African black patients, (21.43%) of white patients and (14.91%) mixed ethnicity patients. Leukopenia was also seen in (34.75%) of African black patients, (-10.62%) mixed ethnicity patients and only one white patient (7.14%). Lymphopenia was observed in (34.78%) of African black patients, (35.40%) mixed ethnicity, and (-28.57%) of white patients. Thrombocytopenia was observed in (21.74%) of African black patients, (16.25%) of mixed ethnicity patient and two white patients (14.29%).
4. Immunological disorders at first presentation among the different ethnic groups:

Immunological disorders were very common at first presentation among all SLE patients. Antinuclear antibodies were the most frequently noted among all SLE patients (74.2%), followed by anti-DNA (62%), then anti-Sm (28.8%) and less frequently anti-centromere antibodies (13.6%). Regarding the antinuclear antibodies, it was observed in (95.65%), (92.86%), (86.34%) of African black, white and mixed ethnicity patients respectively. Anti-DNA antibodies were also seen more frequently in African black patients (73.91%), compared to (61.49%) in the mixed ethnicity and (57.14%) white patients. Anti- Sm antibodies were seen in (56.52%) of the African black patients, (25.47%) of the mixed ethnicity patients and less frequently in white patients (14.29%). On the other hand, anti-centromere antibodies were seen less frequently in only two African black patients(8.7%), (7.1%) white patients and (14.91%) of the mixed ethnicity patients.
**Discussion:**

The first finding of this study was that the female: male ratio was 9:1 in our SLE patients. This is similar to previous studies in Europe, and Hong Kong Chinese but less than another South African study. In our study, we found that the mean age at diagnosis was 28.3 years. This is comparable to studies from India, Malaysia, Hong Kong Chinese and African Americans. The second finding of this study that the most affected group was the mixed ethnicity population (81.4%), followed by the black African group (11.6%), then the white group (7%). This needs to be interpreted in terms of the demographical distribution of the population in Western Cape in South Africa. This would suggest that individuals of a mixed ethnic background may be more susceptible to SLE than the other two groups. In a study carried out in England, Asians were more predisposed to SLE. For example, Asians of Indian, Pakistani and Bangladeshi origins who resided in Leicester, England, were three times more likely to develop SLE than Caucasian whites. This was confirmed by another study conducted in Birmingham, where Asians of the same origins, irrespective of their birthplace, were found to experience over twice the prevalence rate of Caucasians for lupus (Asians 46.7 per 100 000 persons versus Caucasians 20.7 per 100 000 persons). However, in a study carried out by Hopkinson and his colleagues assessing race-specific incidence and prevalence for SLE, the overall one-year prevalence rate for SLE in Nottingham, England, was 24.7 per 100 000 persons, with the highest rate in Afro-Caribbean’s (207/100 000), then Chinese (92.9/100 000), then Subcontinent Asians (48.8/100 000), and then whites (20.3/100 000).

The third findings in this study were related to the clinical manifestations of SLE during the first presentation. Arthritis was the most frequent disorders among the three different ethnic groups. However, there appear to be some differences in the autoantibody profile, frequency of certain specific disease complications, as well as the severity and overall prognosis of the condition. Skin manifestations of SLE are well documented. In our study, we found that malar rash was seen more frequently in the mixed ethnicity group (70.1%), compared to (35.7%) in the white group and (34.7%) in the African black group. Budhoo et al found that malar rash was seen in 88.2%, 70.6%, and 42.3% in the mixed ethnicity, white and African black group respectively. Another finding in our study, that discoid rash was more common in the African black group (52.1%) compared to the mixed ethnicity (22.3%) and white group (7.1%). This contrasts with a study carried out recently in South Africa, where the discoid rash was more common in the mixed ethnicity group (41.2%), compared to (27.7%) in the African black group and (11.8%) in the white group.

We found that photosensitivity was seen more frequently in the white group.
(64.2%) and the mixed ethnicity group (41.6%), while it was not observed in the African black group. This is in agreement with previous studies, were photosensitivity was more common in Europeans (81%) compared to African Americans or Hispanics (both 56%).[14-15] The oral ulcer was not a common presentation in our study, as it was only found in 16.1% of all SLE patients. A similar low prevalence of oral ulcers (12.5%) was observed in the Euro-lupus cohort[14] and 17.2% in the Hong Kong Chinese cohort.[18] compared to prevalence in India (57%),[15] Hispanics and Europeans in the USA (57.3%)[26]

There is cumulative evidence that lupus nephritis is more prevalent in African and Hispanic Americans, as well as Chinese and other Asians. These findings are supported by the LUMINA Study group who showed a higher cumulative frequency of renal disease in African-Americans (68.9%) and Hispanics (60.6%) than Caucasians (29.1%).[9] This is similar to our study, where the highest frequent observation was in Black African with proteinuria and hematuria (52.17%) compared to mixed ethnicity group (31.8%) and white (21.4), whereas, casts were documented in 14.7% of the mixed ethnicity group, and 4.4% in Black Africans, while no casts were observed in the White group.

Neuropsychiatric manifestations of SLE are well known. In a study done by Hanly et al, seizure occurrence was 2.0-fold more in African and 1.6-fold in the Hispanic group compared with the White group using multivariate analysis, with a tendency for seizures to be lower in frequency in Asian individuals with SLE. 16 This is in contrast to our findings, where seizures were more in the mixed ethnicity group (13%), while no Black African patients, presented with seizures at first presentation. Psychosis was significantly higher among the White and Mixed ethnicity group respectively (1 out of 14-7.14%), (11 out of 161 6.8%) compared to (1 out of 23-4.3%) in Black African patients. Hematological disorders at first presentation were slightly more common in the Black African group than the other two groups, although it did not reach statistical significance. These results are comparable to the study done by Budhoo et al, except that the frequency of leucopenia and lymphopenia were more frequently observed among the other ethnic groups.13 There are no discerning differences in the prevalence of anti-nuclear and anti-dsDNA antibodies in patients of different ethnic origins.[17] This was demonstrated by our study, where antinuclear antibodies were seen more frequently among the three ethnic groups (95%, 92% and 86%). In addition to that, there was no significant difference in the frequency of the anti-dsDNA antibodies among the African black, White groups and mixed ethnicity groups in our study. (73%, 57% and 61%). The prevalence of anti-Sm antibodies has been reported to be increased in African-Americans,[17] and black South Africans.17 This is in agreement with our results, where anti-Sm antibodies were seen in 56.5% of the African black group, compared to 26.4%
in the mixed ethnicity group and 14.2% in the white group.

Our study has several limitations, which are the retrospective nature of the study; the disparities in numbers of the different groups which may reflect significant differences in incidence but lack of epidemiological studies make any firm conclusions on this issue difficult; and the disparities in numbers also influenced statistical conclusions while the lack of data of demographical distribution for the drainage area of Tygerberg Academic Hospital, makes definite conclusions on the relative incidence impossible.

**Conclusion:**

The study showed that the most affected group was the mixed ethnicity population, followed by the black African group then the white group. This study focused on the initial presenting symptoms. A long-term cohort on the development of the disease may yield further results on possible ethnic differences. Furthermore, continued research could be conducted into susceptibility loci and phenotypic associations in enriched multi-ethnic cohorts. The causes of death among the three ethnic groups and related to the first presentation is suggested.

**References:**


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