

# Clinical Manifestations of Sarcoidosis among Inner-City African-American Dwellers

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**Objectives:** To characterize clinical, radiographic and physiological features of sarcoidosis among African Americans residing in inner-city Chicago.

**Methods:** This is a retrospective review of medical records of 75 African Americans with biopsy-proven sarcoidosis from internal medicine and pulmonary clinics at three inner-city, acute care hospitals in Chicago.

**Results:** The number of organs involved was  $1.77 \pm 0.94$  (mean  $\pm$  SD). The most common sites for tissue diagnosis were lung (49%), skin (19%) and lymph nodes (16%). Thirty-six (48%) patients had stage-2 and -3 disease on chest x-ray. Electrocardiographic changes and ocular involvement were detected in 23% and 21% of patients, respectively. Nineteen (25%) patients had obstructive defect ( $FEV_1$   $1.71 \pm 0.78$  L/s), 15 (20%) had a restrictive defect [TLC  $4.1 \pm 1.2$  L ( $63.9 \pm 9.2\%$  predicted)]. Three patients had both restrictive and obstructive defect. Forced vital capacity and  $FEV_1$  declined by 0.26 L and 0.09 L/s per year, respectively, in patients with an obstructive defect. Most patients (91%) were treated with prednisone for  $3.8 \pm 3.9$  years (range 0–20 years).

**Conclusions:** African Americans with sarcoidosis residing in inner-city Chicago express a high rate of chronic progressive disease necessitating corticosteroid therapy. Further studies are warranted to elucidate the reasons underlying this paradigm.

**Keywords:** interstitial lung disease ■ pulmonary fibrosis ■ lymphadenopathy ■ imaging ■ corticosteroids

© 2006. From the Department of Medicine, Northwestern University, Feinberg School of Medicine (Mutlu); Department of Medicine, University of Illinois at Chicago (Rubinstein); and Jesse Brown VA Medical Center, Chicago, IL (Rubinstein). Send correspondence and reprint requests for *J Natl Med Assoc.* 2006;98:1140–1143 to: Dr. Israel Rubinstein, Department of Medicine (M/C 719), University of Illinois at Chicago, 840 S. Wood St., Chicago, IL 60612-7323; phone: (312) 996-8039; fax: (312) 996-4665; e-mail: lrubinst@uic.edu

## INTRODUCTION

Sarcoidosis is a multisystem disease of unknown cause. It affects both sexes, with slight female prominence, and all races, among which African Americans having the highest prevalence in the United

States.<sup>1</sup> The lifetime risk of sarcoidosis is three times higher for African Americans compared to Caucasians (2.4% vs. 0.85%).<sup>2</sup> Sarcoidosis tends to be more severe in African Americans, while Caucasians are commonly asymptomatic.<sup>2-5</sup> In African Americans, age-adjusted mortality rate from sarcoidosis is higher in northern midwestern states, including Illinois.<sup>6</sup>

It came to our attention that a high proportion of our clinic patients, the majority of whom are African-American, had progressive sarcoidosis requiring corticosteroid therapy, which is consistent with the current literature. The epidemiology of sarcoidosis among the African-American population in Chicago (i.e., upper midwest region of the United States) has not been previously described. Better understanding of the epidemiology of sarcoidosis in this region is particularly important because of the high prevalence of other granulomatous diseases of the lung (e.g., blastomycosis, histoplasmosis and tuberculosis), which can be confounded with sarcoidosis. Hence, sarcoidosis can be easily overlooked in African Americans, and patients may not get appropriate medical care.

The purpose of this study was to characterize the clinical manifestations of sarcoidosis in patients from inner-city Chicago. Consequently, we performed a retrospective analysis of patients with evidence for granulomatous disease on tissue biopsy.

## METHODS

### Setting

The study included patients with biopsy-proven diagnosis of granulomatous disease, who were followed at three inner-city hospitals in Chicago, including University of Illinois Medical Center, Jesse Brown Veterans Administration (VA) Medical Center and Michael Reese Hospital and Medical Center (a major affiliate of University of Illinois at Chicago).

### Study Design

The study was a retrospective review of medical records in the outpatient internal medicine and pulmonary clinics of all three hospitals. Using the patient

databases, all records with the biopsy-proven diagnosis of granulomatous disease were reviewed. Patients with presumed clinical diagnosis of granulomatous disease without biopsy (i.e., sarcoidosis, tuberculosis) were excluded from the study. The project was reviewed and approved by the institutional review boards of University of Illinois at Chicago, Jesse Brown VA Medical Center and Michael Reese Hospital. Informed consent was waived in accordance with the Department of Health and Human Services regulations for the protection of human research subjects 45 CFR 46.116(d).

## Measurements

Data were collected using a form that included patient demographics, organ system involvement, need for systemic corticosteroids and complications.

## Statistical Analysis

Data are reported as mean  $\pm$  SD (range). Statistical analyses were performed using GraphPad Prism (GraphPad Prism Software Inc.).

## RESULTS

Medical records of 75 African-American patients with biopsy-proven sarcoidosis were reviewed. Fifty-seven (76%) patients were male. Characteristics of these patients are shown in Table 1. Concomitant diseases included hypertension (23%), asthma or chronic obstructive pulmonary disease (19%), and diabetes mellitus (16%).

In the majority of patients, the diagnosis of sarcoidosis was established after a complication related to sarcoidosis (63%) and during routine physical examination (20%) (Table 2). Among 49 patients who were diagnosed with sarcoidosis after presenting with symptoms or complications of sarcoidosis, seven had visual symptoms (one with orbital mass); 18 had respiratory symptoms including cough, dyspnea and chest pain (one patient with pneumothorax); five had both visual and respiratory symptoms; four had hoarseness; four had skin lesions; three had visual symptoms, arthralgia and skin; two had weight loss; and five had mental status changes (one with seizure). The most common sites for initial tissue diagnosis were lung (49%), skin (19%) and lymph nodes (16%). The number of organ systems involved clinically was  $1.77 \pm 0.94$ . Based on chest radiographic staging, almost half of the patients (47%) had parenchymal involvement (stage 2–4) in chest radiographs. Electrocardiographic changes and ocular involvement were present in 23% and 21% of patients, respectively.

Pulmonary function studies revealed that 19 (25%) patients had obstructive defect [forced expiratory volume in one second ( $FEV_1$ )  $<0.75$ ] ( $1.71 \pm 0.78$ L/sec). Fifteen (20%) patients had restrictive defect [total lung capacity (TLC)  $<80\%$  of predicted] ( $63.9 \pm 9.2\%$  of predicted). Three patients had both restrictive and obstructive

defect. In obstructive patients, forced vital capacity and  $FEV_1$  declined 0.26 L and 0.09 L/sec per year, respectively (Figure 1). Seventeen (23%) patients had decreased diffusion capacity ( $60.8 \pm 8.3\%$  of predicted). Of these 17 patients, three had obstructive and 11 had restrictive defect, with the remaining three having isolated reduction in diffusion capacity. The majority of patients (68 patients, 91%) required systemic corticosteroids.

**Table 1. Demographics of African-American patients with biopsy-proven sarcoidosis in inner-city Chicago**

n	75
Age*	48 $\pm$ 12
Gender	
Male	59 (79%)
Female	16 (21%)
Smoking History	
Never	46 (61%)
Active	22 (29%)
Past	7 (10%)
Associated Conditions	
Hypertension	19 (25%)
Diabetes Mellitus	12 (16%)
Gout	8 (11%)
Hyperlipidemia	6 (8%)

\* Mean  $\pm$  SD

**Table 2. Diagnosis of sarcoidosis and disease severity in African-American patients with biopsy-proven sarcoidosis in inner-city Chicago**

Initial Diagnosis	n (%)
Conditions Suggesting Diagnosis	
Complication of sarcoidosis	47 (63)
Routine physical examination	15 (20)
Other medical condition	14 (17)
Anatomical Site of Tissue Diagnosis	
Lung	37 (49)
Skin	14 (19)
Lymph node	12 (16)
Other	12 (16)
Radiographic Staging	
Stage 0	33 (44)
Stage 1	6 (9)
Stage 2	16 (21)
Stage 3	16 (21)
Stage 4	4 (5)
Clinical Organ Involvement	
Lung	47 (63)
Skin	26 (34)
Lymph node	17 (23)
Eye	16 (21)
CNS	11 (15)
Pulmonary Function Tests	
Restrictive defect (TLC $<80\%$ )	15 (20)
Obstructive defect ( $FEV_1/FVC <75\%$ )	19 (25)
Restrictive and obstructive defect	3 (4)

teroid therapy. Of these, 14 (19%) have been on prednisone continuously since the diagnosis of sarcoidosis. for an average of 6.4 years (range 1–20 years). Fifty-four patients have been on systemic corticosteroids intermittently ( $3.24 \pm 3.22$  years) (Table 3).

**DISCUSSION**

The results of this study show that African-American patients with sarcoidosis residing in inner-city Chicago express a high rate of chronic progressive disease necessitating systemic corticosteroid therapy for a prolonged period of time. In addition, unlike slight female preponderance reported in patients with sarcoidosis,<sup>1,3,7</sup> we found a higher incidence of sarcoidosis among males residing in inner-city Chicago. However, this discrepancy might be

partly attributed to the inclusion of patients from a VA hospital, where the majority of patients are males.

It is well established that racial distribution of sarcoidosis in large metropolitan areas in the United States differs from that reported in Europe and Japan.<sup>3</sup> This, in turn, implies differences in genetic and/or environmental risk factors for sarcoidosis operating in the United States versus other countries. To this end, African Americans predominate among patients with sarcoidosis in New York and Los Angeles.<sup>1-3</sup>

The results of this study are consistent with previous reports on the higher incidence of progressive sarcoidosis among African Americans.<sup>3,8</sup> Almost 50% of our patients had stage 2–4 disease. Likewise, we found a high incidence of extrathoracic sarcoidosis among our patients,

with skin and eye being the two most common organs involved.<sup>8,9</sup> Lastly, diagnosis in the majority (about two-thirds) of the patients was made following presentation with symptoms or complications related to sarcoidosis.

The most intriguing finding of our study was the higher need for systemic corticosteroid therapy among African-American patients with sarcoidosis in inner-city Chicago relative to New York and Los Angeles (91%, 67% and 35%, respectively).<sup>3</sup> Similarly, 62% of African-American patients with sarcoidosis residing in Washington, DC required systemic corticosteroid therapy to control their disease.<sup>8</sup> This discrepancy cannot be attributed to worse lung disease, as there were no differences in radiographic staging between these groups. As a result of increased duration and dose (26 mg/day) of systemic corticosteroid therapy, increased adverse effects were also observed, including weight gain and Cushingoid appearance (12% of patients).

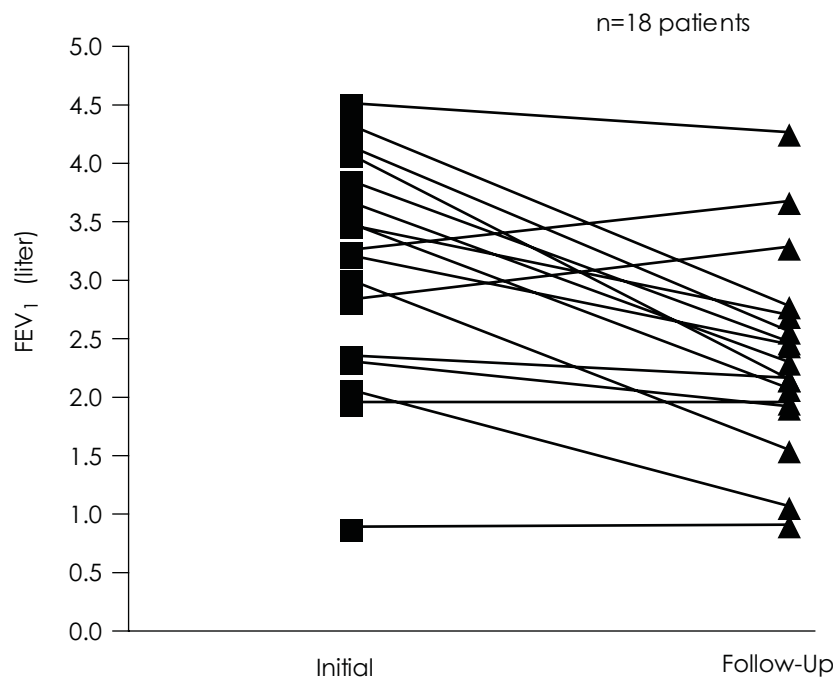
Collectively, these data show that sarcoidosis among African Americans residing in inner-city Chicago is severe, requiring systemic corticosteroid therapy in the majority of patients. While poor socioeconomic status and lack of insurance have been suggested to be the cause of increased disease severity in sarcoidosis,<sup>10</sup> additional studies are warranted

**Table 3. Corticosteroid therapy in African-American patients with biopsy-proven sarcoidosis in inner-city Chicago\***

Systemic Corticosteroids	68 (91%)
Continuously	14 (19%)
Intermittently	54 (72%)
Time from Diagnosis to Corticosteroids (Years)*	$3.2 \pm 7.0$ (0–33)
Duration of Corticosteroid Therapy (Years)*	$3.8 \pm 3.9$ (0–20)
Dose of Prednisone (mg/day)*	$26 \pm 26$
Side Effects	
Cushingoid Appearance/Weight Gain	9 (12%)
Cataracts	2 (3%)
Osteoporosis	2 (3%)
Psychosis	2 (3%)

\* Data are means  $\pm$  SD

**Figure 1. Changes in FEV<sub>1</sub> during Follow-Up**



to further investigate the cause of progressive disease in African Americans due to serious side effects associated with systemic corticosteroid therapy.

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