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# Rheumatic disease in Jamaica

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SUMMARY The relative prevalence and clinical pattern of the major rheumatic diseases in the patient population of a teaching hospital in Jamaica were studied over the 3-year period 1974–7. The prevalence of systemic lupus erythematosus approached that of rheumatoid arthritis (RA). All grades of severity of RA were seen, and there was an unusually high proportion of females with RA. Rheumatic fever and exacerbations were relatively common, and in the absence of carditis differentiation from infective polyarthritis, especially gonococcal, was occasionally difficult.

Much has been learnt from comparative studies of the pattern and prevalence of rheumatic diseases in different populations. Jamaica, with its island population of 2 million of predominantly African descent, has features of particular interest. Previous reports from Africa have indicated that systemic lupus erythematosus (SLE) is an uncommon disease but that rheumatoid arthritis (RA) is prevalent in some communities (Greenwood, 1968; Hall, 1966; Solomon *et al.*, 1975). In the USA on the other hand SLE is commoner in blacks than in whites (Siegel and Lee, 1973; Fessel, 1974), the prevalence exceeding 1:250 of black females over 15 years of age in the latter survey. Until recently data reported from Jamaica depended on rural community surveys (Lawrence, 1977).

In 1974 a rheumatic disease unit was instituted in the University Hospital of the West Indies (UHWI), funded both by the University and the Wellcome Trust. The clinical posts were those of physician-rheumatologists, and the rheumatic disease clinic was carried on in addition to and separate from the main general medical clinics. This study reports the patterns and clinical features of the major rheumatic diseases as seen in this unit over the 3-year period 1974–7.

## Materials and methods

### POPULATION STUDIED

The University Hospital of the West Indies (UHWI) in Jamaica is the major teaching hospital of the University of the West Indies, with 600 beds, of which 100 are general medical. It is one of 2 large general hospitals serving the Kingston metropolitan area (population 600 000), but because of its facilities and provision of free medical care it is also a referral centre for the whole island (population 2 million). Because of the presence of a number of private hospitals in Jamaica the population studied was largely drawn from the lower socioeconomic groups, which constitute the great majority of the population.

In 1974, a comprehensive referral system was developed within the Department of Medicine at UHWI with good co-operation from the general physicians, who saw these patients before the inception of the rheumatology service. This report concerns patients over 12 years of age with rheumatic diseases admitted to hospital or seen in the rheumatology outpatient clinic over the period October 1974 to September 1977. Patients seen in the rheumatology outpatient clinic were studied prospectively, and a separate rheumatology clinic record was kept which was reviewed at the end of the 3-year period.

### CRITERIA FOR DISEASE CLASSIFICATION

Rheumatic fever and exacerbations (RF) were classified according to the revised Jones criteria (Stollerman *et al.*, 1965). Gonococcal (GC) arthritis was diagnosed in patients with acute febrile polyarthritis who had a positive culture for gonococcus in synovial fluid (3%), blood (17%), or by vaginal, cervical, throat, or rectal swab (36%). In 49% of cases cultures were negative, but the combination of a urethral or genital discharge in the preceeding 4 weeks with a clinical response within 48 hours of starting penicillin therapy was considered indicative

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of the diagnosis. Two patients had positive cultures from both blood and rectal swabs. Rheumatoid arthritis (RA) was classified according to the American Rheumatism Association criteria (Ropes *et al.*, 1958), and only patients with definite or classical disease are included in this report. SLE was classified according to the ARA criteria (Cohen *et al.*, 1971) in 84% of patients, and the remaining patients all had 3 criteria and an elevated DNA binding. The age of onset of SLE or RA was taken as the time of initial clinical diagnosis.

### LABORATORY METHODS

The latex fixation test for rheumatoid factor was used, and a titre of over 40 dilutions given as positive. Antinuclear antibodies were tested for with calf thymus nuclei. DNA antibodies were measured by the Farr ammonium sulphate precipitation method (Pincus *et al.*, 1969). Complement components were measured by single radial diffusion in agar with commercial antisera. Antibodies against extractable nuclear antigen (ENA) were measured as previously described (Besnihan *et al.*, 1977).

## Results

### INPATIENTS

Table 1 shows the final diagnosis in 346 patients in various major groups admitted to the medical wards. It is seen that in Jamaica rheumatic fever and exacerbations, rare in developed countries, are still an important cause of admission to hospital. Perhaps even more striking is the high prevalence of SLE. Gonococcal arthritis accounted for the great majority of the cases of infective arthritis. Polyarthralgia in sickle cell anaemia occurred as a part of a painful crisis in 38 out of 40 patients. Gout was an infrequent cause of admission to hospital.

Table 2 lists the diagnosis in 111 inpatients presenting with acute arthritis (that is, of duration less than six weeks). Gonococcal arthritis and rheumatic fever were the major groups. In a number (14%) of patients no definite final diagnosis was made; these are discussed below. In the absence of carditis, and in the nonpaediatric population studied here, differentiation of rheumatic fever from GC arthritis on clinical grounds was sometimes difficult. Table 3 shows that, of the clinical features listed, only symmetry of joint involvement was of possible diagnostic value, being uncommon in gonococcal arthritis but present in 50% of patients with acute RF. The revised Jones criteria were noted to be positive in 26% of patients with culture proved GC arthritis.

Table 1 *Major inpatient diagnostic groups*

| | *Number* | (%) | *Mean age (years)* | *Age of onset (years)* |
|---|---|---|---|---|
| Rheumatic fever* | 98 | (28) | 15·3 | (9·5) |
| SLE | 78 | (22) | 36·5 | (31·0) |
| RA | 61 | (18) | 45·0 | (39·0) |
| GC arthritis | 39 | (11) | 19·4 | (19·3) |
| Sickle cell painful crisis | 40 | (12) | 18·7 | |
| Miscellaneous** | 30 | (9) | — | |

*Includes exacerbations. **Includes nongonococcal infective arthritis (6 patients), scleroderma (5), dermatomyositis or polymyositis (5), gout (4), Reiter's disease (4), chondrocalcinosis (4), and psoriatic arthritis (2).

Table 2 *Acute arthritis in 111 patients*

| | *Number of patients* | (%) |
|---|---|---|
| Rheumatic fever (arthritis and carditis) | 24 | (23) |
| Rheumatic fever (arthritis only) | 28 | (25) |
| GC arthritis | 21 | (19) |
| Idiopathic | 15 | (14) |
| Septic non-GC arthritis | 5 | (5) |
| Miscellaneous* | 15 | (14) |

*Includes SLE (4 patients), RA (4), Reiter's disease (3), gout (2), lymphoma (1), chondrocalcinosis (1).

Table 3 *Comparison of the pattern of arthritis in gonococcal infection and rheumatic fever*

| | *Rheumatic fever (without carditis, 28 patients) % of patients* | *GC arthritis (21 patients) % of patients* |
|---|---|---|
| <4 joints | 54 | 62 |
| 4 or more joints | 46 | 38 |
| Large joints | 75 | 62 |
| Large and small joints | 25 | 38 |
| Migratory | 71 | 86 |
| Nonmigratory | 29 | 14 |
| Symmetrical | 50 | 19 |
| Asymmetrical | 50 | 81 |

### OUTPATIENTS

The marked prevalence relative of SLE seen in the inpatient population was also noted in the outpatient clinic population (Table 4), 95 patients with SLE being seen versus 115 patients with definite or classical rheumatoid arthritis. Patients with rheumatic fever and gonococcal arthritis were not

Table 4 *Outpatient groups*

| | *Number of patients* | *Sex (F/M)* |
|---|---|---|
| RA | 115 | 104/11 |
| SLE | 95 | 88/7 |
| DJD | 30 | 19/11 |
| Sickle cell polyarthritis | 9 | 6/3 |
| Gout | 6 | 0/6 |
| Ankylosing spondylitis | 5 | 0/5 |

usually followed up in the rheumatology clinic and are excluded from the outpatient analysis. Possible reasons for the relatively low prevalence of degenerative joint disease will be discussed later. Ankylosing spondylitis was uncommon. Five patients with Reiter's syndrome and 4 with psoriatic arthritis were seen.

### RHEUMATOID ARTHRITIS

Of 115 patients seen, 108 were black, 4 white, and three were Chinese. The female:male ratio was 10:1 (Table 4). The age distribution of patients was possibly bimodal, with peaks in the 3rd and 5th decades (Fig. 1). The mean age at which the diagnosis was initially made was 39·0 years (range 12–73 years), and the mean duration of the arthritis before patients entered this study was 7·0 years (Table 4).

With the exception of vasculitis of the skin, features of RA normally associated with severe disease were frequently seen. Over one-half (Table 5) were in ARA functional class III or IV (Steinbrocker *et al.*, 1949). 76% of patients had radiological erosions (Table 5), 73% were seropositive, 35% had nodules and 23% had antinuclear antibodies, the last being found in significantly increased frequency in severe cases. 10% had symptomatic ocular involvement presenting as grittiness of the eyes or recurrent conjunctivitis. Eight of these patients had keratoconjunctivitis sicca and the remainder scleritis or scleromalacia. Asymptomatic patients were not assessed for ocular involvement. Other complications included acute rupture of the knee, pulmonary fibrosis, and neuropathy (Table 5). In 11 patients the neuropathy was of a sensory peripheral type (stocking distribution) with complaints of dysaesthesiae in the legs. Two patients had transient foot drop, both unilateral. Distal interphalangeal joint involvement (12% of patients) was seen in patients with functionally severe, extensive, and seropositive disease.

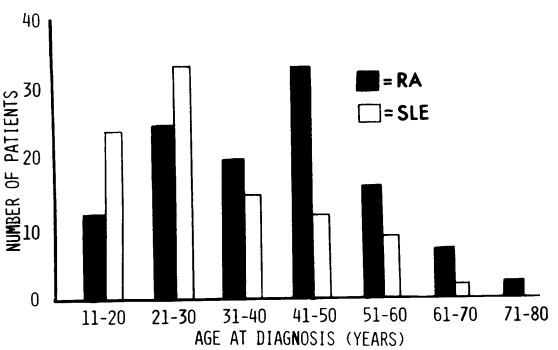


Fig. 1 *Age distribution of patients with rheumatoid arthritis (RA) and systemic lupus erythematosus (SLE).*

Table 5 *Features of RA in 115 patients*

| | | *Number of patients* | (%) |
|---|---|---|---|
| ARA functional class | I | 5 | (4) |
| | II | 48 | (42) |
| | III | 36 | (31) |
| | IV | 26 | (23) |
| Erosions | | 87 | (76) |
| Symptomatic eye changes | | 11 | (10) |
| DIP arthritis | | 14 | (12) |
| Rheumatoid factor positive | | 83 | (73) |
| ANA positive | | 26 | (23) |
| Neuropathy | | 13 | (11) |
| Acute knee rupture | | 8 | (7) |
| Diffuse pulmonary fibrosis | | 5 | (4) |
| Cord compression | | 3 | (3) |

### SYSTEMIC LUPUS ERYTHEMATOSUS

Ninety-five patients with SLE were seen, of whom 93 were black and 2 were Chinese. Seventy-eight were admitted to hospital at some time. The mean age at which the diagnosis was initially made was 31·0 years (range 15–69 years), and the peak age of onset was in the third decade (Fig. 1). The mean duration before inclusion in this study was 5·5 years. The female: male ratio was 11:1. The major clinical features of the group are listed in Table 6, where they are compared with 2 contemporary large hospital based series from Canada and the United Kingdom (Lee *et al.*, 1977; Grigor *et al.*, 1978). Patients with skin involvement had a malar rash (32%), photosensitivity (12%), discoid lesions (14%) acute or chronic leg ulceration (8%), and purpura (1%). A history of sunlight sensitivity was noticeably less common than in other series.

Renal involvement was defined as a serum creatinine of >150 mmol/l, proteinuria of > 1g/24

Table 6 *Cumulative major features of SLE compared with contemporary series (% of patients)*

| | *This series* | *Grigor* et al. *(1978)* | *Lee* et al. *(1977)* |
|---|---|---|---|
| Polyarthritis | 89 | 98 | 61 |
| Alopecia | 70 | 64 | 38 |
| Renal involvement | 40 | 40 | 49 |
| CNS involvement | 48 | 50 | 40 |
| Skin (not including alopecia) | 58 | 84 | 48 |
| Pleurisy | 32 | 52 | 31 |
| Splenomegaly | 11 | 16 | 10 |
| Raynaud's syndrome | 14 | 32 | 45 |
| Generalised lymphadenopathy | 40 | 30 | 40 |
| Haemolytic anaemia | 19 | 12 | 14 |
| Leucopenia | 43 | 46 | 41 |
| Thrombocytopenia | 14 | 26 | 16 |
| Photosensitivity | 12 | 28 | 50 |

hours, cellular or granular urinary casts, or haematuria of over 5 erythrocytes per high-power field. Of the patients with renal impairment 15 were biopsied. Three showed minimal change, 6 focal proliferation, 1 predominantly membranous change, and 5 diffuse proliferative change. The renal histological abnormalities in some of these and other patients at the UHWI in Jamaica have been previously described (Amin *et al.*, 1978). Table 7 lists the varieties of central nervous system disorders encountered. 'Organic' syndromes were characterised by impairment of orientation and intellectual function. They were usually seen in association with 'functional' states (severe depression, schizophreniform or manic behaviour) and a few patients alternated from 'organic' to 'functional' states ('Mixed' syndromes) during a single exacerbation. Of 20 patients with neurological deficits 9 had associated functional or organic syndromes. Five patients subsequently shown to have SLE had been previously admitted under psychiatric care to the mental hospital (Bellevue) in Kingston. For this reason the incidence of antinuclear antibodies in the mental hospital was determined in 350 females inpatients aged 15–60 years. 33% of these were positive (with a grading of 2+ or greater) compared with a positivity rate of 23% in patients with classical or definite rheumatoid arthritis and 11% in female general medical patients in the same age group on whom the test was requested for clinical reasons.

A positive family history was obtained in 12 patients (12%), in 9 (9%) of whom it was substantiated (on the basis of the ARA criteria) by examination of the relative or of the case records. In 8 of these patients a first-degree relative was affected and in one the relationship was of second degree. No patients were seen in which more than 2 family members were affected. Table 8 lists the serological findings in the SLE patients. 40% of patients with negative ANA and DNA binding were in clinical remission at the time the tests were done. Patients with anti-ENA antibodies were typical of the whole group of SLE patients, and 94% also had antibodies to DNA. Low C3 and C4 levels (Table 9) were seen both in patients with and without overt renal disease, though more frequently in the latter. C4 concentrations were depressed more often than C3 levels. Normal C3 and C4 levels were rarely seen in the presence of overt renal disease.

Table 7 *Neuropsychiatric SLE*

| | *Number of patients* |
|---|---|
| Functional states | |
| Severe depression | 14 |
| Schizophreniform state or mania | 5 |
| Mixed organic and functional states | 10 |
| Coma | 2 |
| Neurological deficits | |
| Fundal exudates | 5 |
| Cranial nerve deficits | 3 |
| Convulsions | 3 |
| Transverse myelitis | 3 |
| Peripheral neuropathy | 3 |
| Hemiplegia | 2 |
| Parkinsonian state | 1 |

Table 8 *Serological findings in SLE compared with contemporary series*

| | *This series* (%) | *Grigor* et al. *(1978)* (%) | *Lee* et al. *(1978)* (%) |
|---|---|---|---|
| ANA | 84 | 100 | 88 |
| Anti-DNA | 82 | 100 | — |
| Anti-ENA | 38 | 20 | — |
| Rheumatoid factor | 39 | 20 | 37 |
| False positive STS | 12 | 11 | 8 |
| LE cells | 61 | 85 | 69 |

Table 9 *Complement and SLE*

| | *% of non renal patients (56 patients)* | *% of renal patients (27 patients)* |
|---|---|---|
| Low $C_4$ / Normal $C_3$ | 21 | 15 |
| Low $C_4$ / Low $C_3$ | 34 | 75 |
| Normal $C_4$ / Low $C_3$ | 7 | 7 |
| Normal $C_4$ / Normal $C_3$ | 38 | 3 |

Normal levels: $C_3$, 77–115% NRS; $C_4$, 52–170% NRS (NRS = normal reference serum).

## Discussion

Of interest in this study are the findings in our hospital clinic population of a relatively high prevalence of SLE, of the high incidence of parameters of severe disease in patients with rheumatoid arthritis, and the high prevalence of rheumatic fever and gonococcal arthritis in our hospitalised patients.

Hospital clinic populations naturally consist of patients with disease patterns generally more severe than patients drawn from community surveys. On the other hand only small numbers of cases of RA and SLE are found in epidemiological community surveys, and incomplete case finding could easily influence the conclusion of such studies about the spectrum and severity of diseases, especially in underdoctored populations. In addition there may

be important differences in the prevalence of rheumatic diseases between urban and rural communities, as has been shown for RA in South Africa (Beighton *et al.*, 1975; Meyers *et al.*, 1977).

The prevalence of RA in Jamaica has been reported as similar to that in Caucasian populations (Lawrence *et al.*, 1966). Our study indicates that contrary to the findings of that study, which was based on a rural population sample, RA in Jamaica is as severe a disease as that seen in temperate countries. With the exception of dermal vasculitis all the usual parameters of severe disease were seen as frequently in our patients as in conventional descriptions from developed countries (Boyle and Buchanan, 1971; Ragan, 1972). The absence of dermal vasculitis is difficult to explain; mild cases have been overlooked in our predominantly dark skinned patients. Certainly the prevalence rates for RA reported by Lawrence *et al.* (1977) in Jamaica and the spectrum of disease as seen in this study together suggest that RA is a major cause of chronic disability in Jamaica. The unusually heavy preponderance of women in our patients with RA suggests that either the sex ratio for this disease in Jamaica is not the usual one, or perhaps that RA severe enough to cause attendance at hospital clinics is much commoner in women than in men. The levels of social services and economic factors also influenced the spectrum of diseases seen, and minor degrees of osteoarthritis and soft-tissue rheumatism are almost certainly under-represented.

One of the features of the disease patterns seen is the high prevalence of SLE. The peak age of onset of SLE in our patients was a decade earlier than that in a predominantly Caucasian series of patients (Lee *et al.*, 1977). The knowledge that mild forms of SLE are common in carefully studied communities (Fessel, 1974) suggests that its true prevalence is even greater in Jamaica that in our study suggests. In the USA the prevalence of SLE exceeded 1:250 in black females over the age of 15 years in one community (Fessel, 1974). However, SLE appears to be a rare problem in hospitals in Africa (Greenwood 1968 (Hall, 1966). The reasons for this apparently high prevalence in Jamaica are unknown. Only indirect evidence exists at present for an infective aetiology such as C type viruses (Mellors and Mellors, 1978). Ultraviolet light is a known environmental triggering factor; however, our patients have less overt sunlight sensitivity as a group than that reported in other series. There was a high incidence of familial SLE in our patients, 9% as compared with an estimated prevalence in first-degree relatives of 0·1–1·5% (Lawrence, 1977). The relative contributions of heredity and environment to this observation are uncertain. Comparison of native and emigre populations of Jamaicans, could yield useful information on this point.

This study also illustrates the difficulties of classification of patients with acute arthritis in countries where there is a high incidence both of gonococcal arthritis and rheumatic fever. Rheumatic fever, as in many developing countries, is a major problem in Jamaica and the West Indies. The problems encountered in prophylaxis have been reviewed (Hassell and Stuart, 1974). Where definite carditis exists, there is little difficulty in diagnosis. However, in our study the revised Jones criteria were noted to be positive in 26% of patient who had culture proved GC arthritis. Furthermore in almost one-half of patients finally diagnosed as having GC arthritis the diagnosis was not supported by positive cultures but by the less specific criteria of genital or urethral discharge and a response to penicillin. Even by these criteria some patients with acute arthritis (14%) were unclassifiable.

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