

POLYARTHRITIS IN WESTERN NIGERIA*

I. RHEUMATOID ARTHRITIS

BY

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Rheumatoid arthritis, Still's disease, and gout have all been seen in tropical Africa (Table I), but little is known of the importance of these conditions in the health of the indigenous population of this region. It was, therefore, considered that a study of patients presenting with polyarthritis at a large hospital in Western Nigeria might be of value. This paper describes the methods employed during this study and the findings in a group of Nigerian patients with chronic polyarthritis who satisfied the American Rheumatism Association (ARA) criteria (Ropes, Bennett, Cobb, Jacox, and Jessar, 1959) for a diagnosis of definite or probable rheumatoid arthritis. A second paper describes the features of Nigerian children with Still's disease, and a third describes the findings in patients presenting during the course of this survey with other forms of polyarthritis.

TABLE I
PREVIOUS REPORTS OF THE OCCURRENCE OF
RHEUMATOID ARTHRITIS, STILL'S DISEASE, AND GOUT
IN TROPICAL AFRICA

Condition	Country	Authors	Date
Rheumatoid arthritis	Malawi	Goodall	1956
	Uganda	Shaper and Shaper	1958
	Kenya	Harries	1962
	Liberia	Hijmans, Valkenburg, Muller, and Gratama	1964
	Senegal	Cave, Sankalé, Bobo, and Moulancier	1965
	Kenya Nigeria	Hall Mohamed	1966 1966
Still's disease	Senegal	Dubois, Guérineau, Cayret, Grelrier, and Ravix	1963
	Nigeria	Anumonye	1964
Gou	Uganda	Trowell	1947
	Ruanda	Fain, Duren, Ducep, and Bein	1956 1959
	Kenya Rhodesia	Shepherd-Wilson and Gelfand	1962
	Senegal	Pène, Bernou, Frament, and Kiese	1965
	Uganda	Kibukamasoke	1968
	Uganda Senegal	Sankalé, Diop, Quénum, Frament, and Ancelle	1968

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Material and Methods

The town of Ibadan is situated within the forest region of Western Nigeria approximately 7° north of the equator. The daily temperature rarely falls below 70° F., and temperatures of 90° F. are reached during the dry season. The humidity remains high throughout the year. University College Hospital (UCH) serves the town of Ibadan and the heavily populated surrounding areas, a population of over 3 million. A few patients are referred to UCH, Ibadan, for specialist opinion from other parts of the country. Patients seen in the specialist clinics or admitted to hospital are selected from the large numbers attending the daily general out-patients clinic.

The case notes and x rays of all patients admitted to the hospital with polyarthritis since 1957 were reviewed. Nearly all of them had defaulted from the out-patients clinic. Although attempts at follow-up were hindered by civil disturbance in Nigeria, culminating in a civil war, 70 per cent. of these patients were eventually traced, and indirect information was available about a number of others who had fled to the Eastern Region (Biafra). All new cases of polyarthritis, both in-patients and out-patients, presenting at UCH during the period 1965-1967 were seen by the author and investigated more fully than is usually possible during routine clinical practice in a developing country. Records of out-patients presenting before 1965 were not available. The diagnoses made in these two groups are shown in Table II (opposite).

Haematological, biochemical, serological, bacteriological, and parasitological investigations were performed by standard methods. Rheumatoid factor was assayed by a modified latex-fixation test and by the human erythrocyte agglutination test (HEAT) (Valkenburg, 1963). Synovial biopsies taken from patients presenting early in the series were obtained by open biopsy but subsequent specimens were obtained by punch biopsy. X rays of the affected joints had been taken in all patients. X rays of the hands, feet, pelvis, knees, cervical spine, and chest were taken routinely in patients presenting for the first time during the period 1965-1967. X rays of the hands and feet were taken at follow-up examination in the patient's compound using a portable x-ray machine powered by a Land-Rover engine.

Haematological and serological findings in patients

TABLE II
DIAGNOSES MADE IN PATIENTS PRESENTING AT UCH,
IBADAN, WITH POLYARTHRITIS

Diagnosis	Admissions 1957-66	New Patients (In-patients and out-patients) 1965-67
Rheumatoid arthritis	42	35
Still's disease	21	10
Acute tropical polyarthritis	28	12
Rheumatic fever	23	8
Septic polyarthritis	19	6
Arthritis and Urogenital disease	14	17
Polyarthritis and Tuberculosis	8	3
Gout	6	4
Generalized osteoarthritis	4	7
Ankylosing spondylitis	3	1
Miscellaneous	9	9
Undiagnosed	11	14
Total	188	126
Total for All Diseases	98,454	67,377
Total for Specialist Clinics		40,817

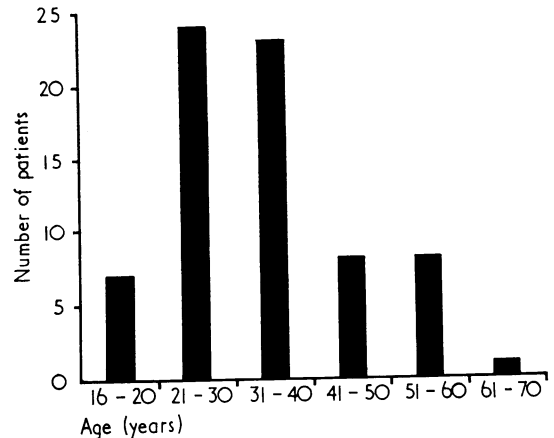


Fig. 1—Age distribution of 71 Nigerian patients with rheumatoid arthritis.

with polyarthritis have been compared with values obtained in healthy Nigerians during the course of a village survey into the prevalence of rheumatic diseases in Western Nigeria undertaken in conjunction with Dr. H. A. Valkenburg and Dr. A. S. Muller of the University of Leiden.

PART I. RHEUMATOID ARTHRITIS

Detailed clinical information was available for 71 adult patients with polyarthritis who satisfied the ARA criteria for a diagnosis of definite or probable rheumatoid arthritis; 70 per cent. of these patients had been admitted to hospital during the period 1957-1967; most of the others presented in the out-patients department during the period 1965-1967, and a few were already attending the out-patients department at the time that this study commenced. As a result of these selection procedures the series is biased in favour of patients with severe disease.

Of the 71 patients 38 were male and 33 female; their age distribution is shown in Fig. 1. Analysis of the tribal origin, domicile, and occupation of the patients showed no unusual features.

Clinical Features of Arthritis

Six patients gave a history of a past episode of arthritis 8 months to 3 years before presentation at UCH, Ibadan. Although all had made a complete symptomatic recovery from this initial episode it was not known whether their joint signs had completely resolved. All 71 patients presented with a history of joint pain or swelling. Only ten complained spontaneously of morning stiffness and a history of

morning stiffness was rarely elicited on direct questioning, partly because of language difficulties. Many patients also complained of fever but other complaints were rare. None of the patients gave a history of recent urogenital disease. Two male patients gave a history of a recent attack of diarrhoea but neither had any other features of ulcerative colitis or post-dysenteric Reiter's syndrome. Several patients had received treatment at their local government hospital before presenting at UCH and the mean duration of symptoms at the time of presentation was 1.6 years for females and 1.8 years for males.

Clinical examination showed that wrists, ankles, knees, and fingers were all frequently involved (Table III). The arthritis was markedly asymmetrical in only two cases.

TABLE III
SITE OF JOINT INVOLVEMENT AT THE TIME OF
PRESENTATION IN 71 NIGERIAN PATIENTS WITH
RHEUMATOID ARTHRITIS

Joints	Percentage of patients with these joints involved
Wrists	72
Ankles	69
Knees	61
Proximal interphalangeal joints of fingers	59
Metacarpophalangeal joints	51
Elbows	44
Metatarsophalangeal joints	24
Shoulders	18
Cervical spine	18
Interphalangeal joints of toes	10
Distal interphalangeal joints of fingers	7
Hips	4
Temporomandibular joints	3

Extra-articular Findings

Nodules were found in only four patients. One patient had extensive onchocerciasis which was almost certainly the cause of his nodules. The remaining three nodules, which appeared to be due to rheumatoid disease, were biopsied, but one contained the adult worms of *O. volvulus* and in another the histological findings were those of tuberculoid leprosy, so that only one appeared to be a rheumatoid nodule.

Rheumatoid vascular lesions were not seen.

Peripheral neuritis was found in only one patient, a middle-aged woman who also had diabetes.

Pyrexia was observed frequently in patients admitted to hospital and three ran a high fever with daily temperature spikes to over 102° F. The pyrexia was usually of a remittent type.

Splenomegaly was noted in fourteen patients.

Iritis developed in two patients during the course of their illness, and a diagnosis of *Reiter's disease* was suspected but neither had any other clinical or radiological features that would support this diagnosis.

Basal crepitations were heard in three patients. In two of these cases chest x rays showed changes suggestive of interstitial pulmonary fibrosis and the third probably had mild bronchiectasis.

Haematological Findings

Haemoglobin levels obtained in the patients with rheumatoid arthritis were compared with those obtained in healthy adult Nigerians during a village survey. 58 per cent. of the male patients and 74 per cent. of the female patients had haemoglobin levels below the mean values of the control groups (Figs 2 and 3). However, only a few patients were severely anaemic and in these

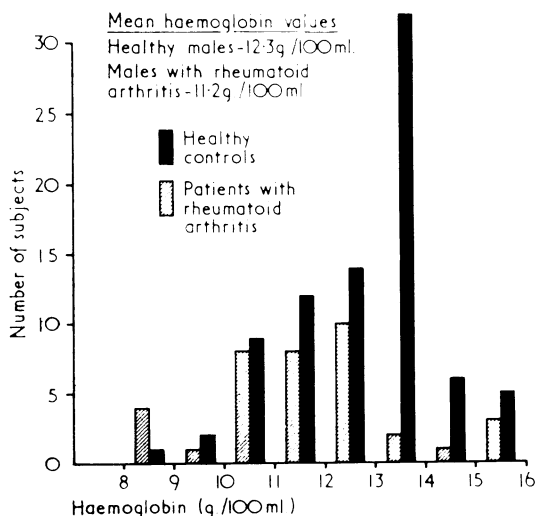


Fig. 2.—Distribution of haemoglobin levels in 38 male Nigerian patients with rheumatoid arthritis and 81 healthy male controls.

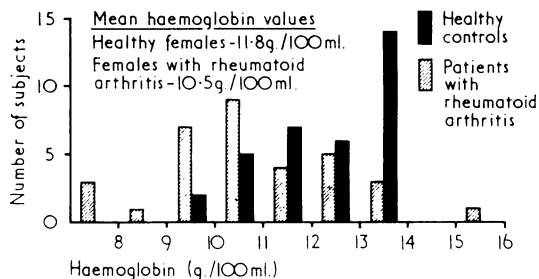


Fig. 3.—Distribution of haemoglobin levels in 33 female Nigerian patients with rheumatoid arthritis and 34 healthy female controls.

cases there was usually some other cause for the anaemia. The anaemia was found to be normochromic and normocytic unless there was an associated cause of blood loss such as a heavy hookworm infestation.

Marrow punctures performed in five patients showed normoblastic erythropoiesis; in four of these the marrow plasma cell count was increased and in three the intracellular iron stores were depleted.

Only four patients had an erythrocyte sedimentation rate (ESR) less than 40 mm./hr and the mean for the group was 80 mm./hr. Elevation of the ESR is, however, found in over 50 per cent. of apparently healthy Nigerians living in this area. The distribution of the genotype, determined in 57 patients, showed no significant difference from that observed in patients admitted to UCH with other conditions.

Biochemical Findings

A significantly raised serum uric acid level was found in only one of the 48 patients in whom the investigation was carried out. This elderly male patient, who was a wealthy trader, had no clinical features of gout.

Many of the Nigerian patients with rheumatoid arthritis were found to have elevated γ -globulin levels. This is a common finding in healthy Nigerians and is, therefore, difficult to evaluate (Edozien, Boyo, and Morley, 1960). Immunoglobulin levels in Nigerian patients with rheumatoid arthritis are being studied.

Parasitological Findings

Patients were investigated for the presence of some of the parasitic infections seen commonly at Ibadan. Blood films showed that only two patients had loiasis, and skin snips from 38 patients yielded only two containing microfilariae of *O. volvulus*. None of the patients had ova of *S. haematobium* in the urine. Stool specimens contained a variety of different ova, but the findings did not differ from those observed in patients admitted to UCH., Ibadan, with other diseases. In two patients larvae of *S. stercoralis* were seen; both were receiving steroids. Malaria is holo-endemic in this area and the patients studied would have been exposed to recurrent infection with malaria since childhood.

Rheumatoid Factor

Rheumatoid factor was detected by the HEAT in 9 per cent. of the 53 patients tested and by the latex-fixation test in 13 per cent. The correlation between the two tests was poor. The value obtained for the latex test does not differ significantly from the incidence of a positive test obtained in healthy subjects during a village survey. The value for the HEAT is significantly higher than that obtained during the village survey, but the incidence of a positive test is no higher than that observed in hospital patients with other diseases (Table IV). No difference was found between the clinical, laboratory, and radiological findings in sero-positive and sero-negative patients.

TABLE IV
PRESENCE OF RHEUMATOID FACTOR IN THE SERUM OF NIGERIAN PATIENTS WITH RHEUMATOID ARTHRITIS AND OTHER DISEASES, AND IN HEALTHY NIGERIAN CONTROLS

Diagnosis	Number Tested	Percentage Positive	
		Latex	HEAT
Rheumatoid arthritis	53	13	9
Other joint diseases	132	7	5
General medical diseases	137	10	11
Healthy controls	524	11.4	1.9

Synovial Fluid and Synovial Biopsies

Synovial fluid was obtained from seventeen patients, usually from the knee. In each instance the fluid was sterile on routine culture and on culture for tubercle bacilli. Synovial fluid protein contents varied from 3.7 to 5.9 g./100 ml. (mean 4.6). Cell counts ranged from 500 to 8,000/cu. mm. Differential cell counts varied considerably from patient to patient, the highest polymorphonuclear leucocyte counts being obtained early in the course of the disease.

Synovial biopsies were obtained from twenty patients, mainly from the knee. The range of histological appearances observed was wide but the overall impression was one of mild disease. Cellular infiltration with lymphocytes and plasma cells was frequently observed and in a number of specimens multinucleated plasma cells were an obvious feature. Small, loose aggregates of lymphocytes were seen in six specimens but true lymphoid follicles were not observed. Increased vascularity was noted in fifteen biopsies. Mild subintimal proliferation of the arterioles was observed in two specimens but in the remaining biopsies the vessels were normal.

Radiological Findings

X rays of the hands had been taken in 69 of the 71 patients studied. Abnormal findings were classified according to the criteria of Kellgren, Jeffrey, and Ball (1963). Radiological changes were rarely severe. Erosions, seen in only 21 patients, were observed most frequently in the carpus. A pronounced erosion along the medial border of the scaphoid was a striking feature in fourteen patients.

The metacarpophalangeal joints were rarely involved. Erosions were seen in only nine of the 59 patients in whom the feet had been x rayed. They occurred most frequently on the lateral side of the fourth and fifth metatarsal heads. Radiological signs of chronic inflammatory arthritis were seen in only three of the 61 patients whose knees were x rayed and at the hips in only one of the fifty patients in whom a pelvic film had been taken. In two patients the chest x ray suggested interstitial pulmonary fibrosis.

The mild nature of the radiological findings observed in Nigerian patients with rheumatoid arthritis is brought out by a comparison (Table V) of the findings in Nigerian hospital patients with rheumatoid arthritis with a similar series of patients seen in England (Thould and Simon, 1966). The mean duration of the disease at the time of this x-ray analysis was 3.6 years.

TABLE V
COMPARISON OF RADIOLOGICAL FINDINGS IN HANDS AND FEET OF ENGLISH AND NIGERIAN PATIENTS GRADED ACCORDING TO THE CRITERIA OF KELLGREN AND OTHERS (1963). FIGURES FOR ENGLISH PATIENTS BASED ON THOSE OF THOULD AND SIMON (1966).
(Figures as percentages)

Grade	Hands		Feet	
	Nigerian	English	Nigerian	English
0-1	61	24	77	9
2	28	29	14	44
3	10	31	7	32
4	2	16	2	15
Total No. of Patients	69	105	59	105

Treatment

Most patients obtained satisfactory symptomatic relief from salicylates in a dose of 2 to 4 g./day. In a few cases phenylbutazone was also used.

Steroid therapy was avoided as far as possible and only three patients were started on it during the period 1965-1967. One of these patients had recurrent attacks of iritis which were threatening his vision and the two others had very active disease which did not respond to simple measures.

Gold therapy was tried in four patients with severe disease. Two of the three patients who received a full course of treatment, 1 g. Myocrisin, showed definite improvement.

Admission to hospital for more than a few days was not practicable but during their short period of admission patients were instructed in the performance of some simple exercises and a number of them continued to carry these out after their discharge.

Follow-up

Follow-up information was obtained for 61 (86 per cent.) of the 71 patients in the study.

Seven of the patients are known to have died. One, who had moderately severe arthritis, was transferred from another hospital in a state of severe malnutrition and died shortly after admission to UCH, Ibadan. Another died in congestive cardiac failure secondary to interstitial pulmonary fibrosis which may have been due to rheumatoid disease. In neither case was *post mortem* examination allowed. The cause of death in the remaining five patients was not related to their arthritis.

Ten of the 64 surviving patients were lost to follow-up. Most of these were Ibos who had been forced to flee to the Eastern Region (Biafra) for political reasons. Six patients followed-up for less than 3 months have been excluded from the following analysis in which the outcome of the disease in 48 patients followed for 3 months to 10 years (mean 2 years) after the onset of their disease is reviewed.

The clinical and radiological findings at follow-up examination were assessed according to the criteria of Duthie, Thompson, Weir, and Fletcher (1955) and their follow-up findings in a group of Scottish patients with rheumatoid arthritis are compared with those in the Nigerian series in Table VI. The findings on presentation show no significant differences between the two groups. At the 2 year follow-up the Nigerian patients had fared better than the Scottish patients according to each of the three criteria of assessment used. The differences between the number with Grade 3 or 4 disability at

follow-up and the number who had deteriorated are statistically significant, ($\chi^2 = 11.3$; $P = 0.001$, $\chi^2 = 4.3$; $P = 0.01$ respectively).

Only five of the 48 patients were followed for more than 5 years. The findings in this small group suggest that the benign course of the disease was maintained.

No significant difference was found in the outcome of the disease between patients who had received continuous hospital supervision and those who defaulted shortly after presentation at hospital. Serological status did not appear to influence prognosis.

Only seven of the thirteen patients who showed radiological signs of erosive disease on presentation were found to have improved at follow-up examination, compared with 28 of the 35 patients whose initial *x* rays showed no features of erosive disease ($\chi^2 = 3.3$; $P = 0.05$).

Discussion

Rheumatoid arthritis has been found to be an uncommon cause of admission to UCH, Ibadan (Greenwood, 1968). The possibility that this observation might have been solely due to the large proportion of young people in the Nigerian population was considered, but it was found that rheumatoid arthritis was responsible for only one fifth as many admissions to hospital in Ibadan as to hospitals in England and Wales even after corrections had been made for differences in age structure of the two hospital populations. Little information is available about the importance of rheumatoid arthritis as a cause of illness in other parts of tropical Africa, but reports from Malawi (Goodall, 1956), Uganda (Shaper and Shaper, 1958), and Kenya (Hall, 1966) suggest that there, as in Nigeria, rheumatoid arthritis is not an important cause of admission to hospital. Hospital data are an unreliable indication of disease prevalence, and it is therefore reassuring that the findings of a population survey into the prevalence of rheumatic disease in two Nigerian villages (unpublished data) support the view that clinically manifest rheumatoid arthritis is an uncommon condition in this region.

The diagnosis of rheumatoid arthritis in patients living in a tropical environment presents a number of special problems.

Nodules are a common manifestation of several tropical infections, particularly onchocerciasis and yaws, and biopsy is essential before the presence of nodules can be used as a pointer to rheumatoid disease.

TABLE VI
COMPARISON OF FOLLOW-UP FINDINGS
IN NIGERIAN AND SCOTTISH PATIENTS WITH
RHEUMATOID ARTHRITIS BASED ON THE CRITERIA
AND FINDINGS OF DUTHIE AND OTHERS (1955).
(Figures as percentages)

Findings		Presentation		Follow-up (Mean duration 24 mths in both groups)	
		Scottish	Nigerian	Scottish	Nigerian
Grade of Disability	Grade 1	0	6	28	50
	Grade 2	35	28	44	46
	Grade 3	43	44	25	2
	Grade 4	22	22	3	2
Activity of Arthritis	Very active	26	32	4	6
	Moderately active	63	67	66	52
	Inactive	10	1	31	42
Change in Arthritis	Improved			70	73
	No change			12	23
	Worse			18	4
Total No. of Patients		307	71	282	48

Splenomegaly in a patient presenting with polyarthritis is more likely to be due to associated parasitic infection than to be related to the joint disease.

A raised erythrocyte sedimentation rate is common in apparently healthy members of Nigerian and many other tropical African communities (Trowell, 1960) and is probably related to the presence of multiple parasitic infestations. The erythrocyte sedimentation rate is thus of little value in the differentiation of inflammatory from non-inflammatory polyarthritis.

A raised serum γ -globulin is likewise of no diagnostic value, as this is a common finding in healthy persons in tropical Africa (Trowell, 1960).

Rheumatoid factor is found in patients with leishmaniasis (Kunkel, Simon, and Fudenberg, 1958), trypanosomiasis (Klein and Mattern, 1965), and leprosy (Cathcart, Williams, Ross, and Calkins, 1960), and a high incidence of rheumatoid factor has been recorded in healthy persons in a number of tropical areas (Houba and Allison, 1966; Wells, 1967; Shaper, Kaplan, Mody, and McIntyre, 1968). The finding of a high incidence of positive latex tests in apparently healthy Nigerians is in agreement with these observations. Tests for rheumatoid factor can, therefore, be of only limited value as an aid to the diagnosis of rheumatoid arthritis in some tropical countries.

X rays were found to be more helpful in the diagnosis of chronic inflammatory polyarthritis as abnormal appearances were less frequently obscured by the changes produced by multiple parasitic infections, but soft tissue calcification following loiasis and guinea-worm infestation occasionally gave rise to confusion.

The clinical features of rheumatoid arthritis, as it occurs in temperate climates, have been fully established as a result of a number of careful studies, (Empire Rheumatism Council, 1950; Short, Bauer and Reynolds, 1957). The clinical features of the 71 Nigerian patients described in this study, all of whom satisfied the ARA criteria for a diagnosis of definite or probable rheumatoid arthritis, differed from the established pattern of the disease in a number of important respects. Extensor nodules, found in approximately 30 per cent of European cases of rheumatoid arthritis (Thompson, 1965) were found in only four of the 71 Nigerians, and biopsy showed that the nodules were related to the joint disease in

only one of the four. Vascular lesions of the nail-fold, often seen in European patients with rheumatoid arthritis (Wilkinson and Torrance, 1967), were seen in only one Nigerian, a woman who subsequently developed cutaneous signs of tuberculoid leprosy in the affected fingers. Disease of the small blood vessels is thought to play a part in the aetiology of the peripheral neuritis of rheumatoid arthritis (Pallis and Scott, 1965). It is therefore of interest that no example of this complication was encountered in the Nigerian series. Large vessel arteritis of the type associated with high titres of rheumatoid factor "malignant rheumatoid arthritis" (Schmid, Cooper, Ziff, and McEwen 1961) was not seen. Interstitial pulmonary fibrosis was seen in two patients but in neither was the rheumatoid aetiology of the pulmonary lesion definitely established. One of them showed predominant involvement of the distal interphalangeal joints and was persistently sero-negative.

The incidence of a positive test for rheumatoid factor was no higher among the Nigerian patients with rheumatoid arthritis than among patients admitted to UCH, Ibadan, with other general medical conditions. The incidence of a positive latex test, 13 per cent., is the same as that obtained in a group of healthy villagers of a comparable age group. The mean duration of illness when initial tests for rheumatoid factor were performed was over 2 years. Thus rheumatoid arthritis at Ibadan is nearly always sero-negative. The anti γ -globulin factors found in a small number of patients with the condition are probably unrelated to their joint disease.

Synovial biopsies showed a wide range of histological changes but the overall histological pattern was one of mild disease. Only a few sections showed lymphocyte aggregations and true germinal follicles were not seen. Mild subintimal occlusion of the small arteries in two specimens was the only vascular abnormality noted, supporting the clinical impression that vascular involvement is not a feature of rheumatoid arthritis in Nigerians.

Comparison of the radiological findings in the hands and feet of the Nigerian patients with rheumatoid arthritis with the findings in a group of English patients with the disease showed that the incidence of severe radiological changes was much lower in the Nigerian group. Differences in the methods of selection used for inclusion of patients in these two series could account for this finding. This is, however, unlikely to be the sole explanation of this observation as the Nigerian series was biased in favour of patients with severe disease.

Satisfactory control of symptoms was obtained in nearly all patients with salicylates. Steroids were avoided as far as possible, for their administration carries added hazards in a tropical developing country where patients frequently default from hospital and where numerous infections are prevalent in the community. In addition steroid therapy may activate intestinal parasites in subjects who are in a carrier state. Activation of *S. stercoralis* was observed in two of the three patients in the present series who were given a prolonged course of steroid therapy. Chloroquine was not used, for its withdrawal after a period of treatment, and hence withdrawal of malarial prophylaxis, could possibly be hazardous in a community where immunity to malarial infection is maintained in adults by repeated exposure to infection.

Follow-up of patients with a chronic disease in a tropical developing country presents many problems. Even when treatment is free few patients can afford the transport cost of repeated visits to the out-patients department and they soon default. Consequently it proved necessary to trace patients to their homes in order to determine the outcome of rheumatoid arthritis in Nigerians. This presented many difficulties, but 54 of the surviving 64 patients in the series were eventually found. The findings at follow-up examination were assessed according to the criteria of Duthie and others (1955) and compared with their findings in Scottish patients. Although there was little difference between the two groups in the degree of disability or activity of the arthritis at the time of presentation, at the 2-year follow-up examination the Nigerian patients had fared significantly better than the Scottish patients in spite of the limited treatment that they had received.

The overall pattern to emerge from this study of the clinical features of Nigerian patients with rheumatoid arthritis is thus one of a disease characterized by rarity of nodules, vascular lesions, and radiological erosions, by a low incidence of positive tests for rheumatoid factor, and by a good prognosis.

These findings could be explained in one of two ways: either the patients studied did not have rheumatoid arthritis, although satisfying the diagnostic criteria, or in this community rheumatoid arthritis takes a different course. The possibility that the patients might have some other form of chronic polyarthritis was carefully considered. None had any features of psoriasis or ulcerative colitis which are both uncommon in Nigerians (Clarke, 1959; Greenwood, 1968). None had any positive features of post-venereal or post-dysenteric Reiter's disease,

but it was sometimes difficult to exclude these diagnoses with complete certainty. A careful search was made for the presence of bacterial and parasitic infections but no constant pattern of infection was found. It is, however, possible that a distinct form of chronic polyarthritis occurs in tropical Africa which although resembling rheumatoid disease, has a distinct course and a different aetiology which is in some way related to the tropical environment.

There is evidence that most of the diseases in which autoimmune processes are thought to be involved are uncommon in Nigeria and in some other parts of tropical Africa (Greenwood, 1968). The common occurrence of these conditions in American Negroes suggests that the low incidence of these conditions in tropical Africa may be related in part to the tropical environment. It has been shown that heavy parasitic infections, particularly with malaria, produce marked immunological disturbances, and it has been suggested that these immunological disturbances may have some influence on the development of autoimmune disease (Greenwood, 1968). It is possible that the modified pattern of disease seen in Nigerian patients with rheumatoid arthritis could be related to the immunological disturbances produced in these patients by the presence of multiple parasitic infections since birth.

Summary

The clinical features of 71 adult Nigerian patients with chronic polyarthritis who satisfied the American Rheumatism Association criteria for a diagnosis of definite or probable rheumatoid arthritis are described. They were seen during an investigation into the pattern of polyarthritis among patients presenting at University College Hospital, Ibadan, Nigeria. A low incidence of nodules, vascular lesions, and peripheral neuritis was found. Rheumatoid factor was found no more frequently than in controls, radiological changes were mild, and the prognosis was good. It is suggested that the patients had a distinct form of chronic polyarthritis which has an aetiology related to the tropical environment or that they had rheumatoid arthritis modified in some way by the tropical environment.

I should like to thank the staff of University College Hospital, Ibadan, for allowing me to study patients with polyarthritis under their care and the staff of the M.R.C. Rheumatism Research Unit, Taplow, for their help in the preparation of this paper. Mrs. C. R. O. Barlow helped me greatly in tracing patients to their

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DISCUSSION

DR. F. DUDLEY HART (*London*) observed that when he was in South Africa recently he had seen no cases of definite rheumatoid arthritis among the Bantu.

DR. GREENWOOD, in reply to a question by DR. J. S. LAWRENCE (*Manchester*), stated that he occasionally saw small erosions in the heads of the metatarsals, but had not included these as a diagnostic sign of rheumatoid arthritis. He felt that the lesions were probably traumatic as the people usually walked bare-footed.

DR. D. A. H. YATES (*London*) commented on the high incidence of Reiter's disease amongst Jamaican imm-

igrants to the United Kingdom, and the relatively low incidence of psoriatic arthropathy.

DR. GREENWOOD said that he had not seen a case of established psoriatic arthropathy in the population studied. Reiter's disease, however, was very common and accounted for almost as many cases of chronic polyarthritis as did those who satisfied the criteria for a diagnosis of rheumatoid arthritis. He felt it unlikely that a large number of patients with Reiter's disease had been included in the group which he studied.

DR. A. G. S. HILL (*Stoke Mandeville*), confirming Dr. Hart's observation of a low incidence of rheumatoid arthritis in the Bantu, emphasized that the disease was nonetheless common among the coloured (mixed race) population, particularly in Cape Town.

DR. W. W. BUCHANAN (*Glasgow*), commenting on the clinical and serological manifestations of arthritis amongst Indian populations, made the point that there was a close similarity to the disease seen in the United Kingdom. He felt therefore that differences could not be explained by differences in climate.

REFERENCES

- Anumonye, A. (1964). *W. Afr. med. J.*, **13**, 95 (Juvenile rheumatoid arthritis in Nigerian children).
- Cathcart, E. S., Williams, R. C., Ross, H., and Calkins, E. (1960). *Arthr. and Rheum.*, **3**, 436 (Relationship of the latex fixation test to the clinical manifestations of leprosy).
- Cave, L., Sankalé, M., Bobo, J., and Moulancier, M. (1965). *Rhumatologie*, **17**, 153 (Considérations sur les aspects radiologiques des rhumatismes chroniques chez le noir africain).
- Clarke, G. H. V. (1959). "Skin diseases in the African", p. 2. Lewis, London.
- Dubois, P., Guérineau, P., Cayret, A., Grelier, L., and Ravix, P. (1963). *Arch. franç. Pédiat.*, **20**, 1125 (A propos de trois observations de maladie de Still chez l'Africain).
- Duthie, J. J. R., Thompson, M., Weir, M. M., and Fletcher, W. B. (1955). *Ann. rheum. Dis.*, **14**, 133 (Medical and social aspects of the treatment of rheumatoid arthritis).
- Edozien, J. C., Boyo, A. E., and Morley, D. C. (1960). *J. clin. Path.*, **13**, 118 (The relationship of serum gamma-globulin concentration to malaria and sickling).
- Empire Rheumatism Council (1950). *Ann. rheum. Dis.*, **9**, Supplement (Report on an enquiry into the aetiological factors associated with rheumatoid arthritis).
- Fain, A., Duren, P., Ducep, A., and Bein, M. (1956). *Ann. Soc. belge. Méd. trop.*, **36**, 395 (Un cas de goutte chez un indigène de race Muhutu au Ruanda-Urundi).
- Goodall, J. W. D. (1956). *Cent. Afr. J. Med.*, **2**, 220 (Joint swellings in Africans).
- Greenwood, B. M. (1968). *Lancet*, **2**, 380 (Autoimmune disease and parasitic infections in Nigerians).
- Hall, L. (1959). *E. Afr. med. J.*, **36**, 616 (Two cases of gout among the Kikuyu).
- (1966). *Ibid.*, **43**, 161 (Polyarthritis in Kenya).
- Harries, J. R. (1962). *Ibid.*, **39**, 69 (Rheumatoid nodules in an African).
- Hijmans, W., Valkenburg, H. A., Muller, A. S., and Gratama, S. (1964). *Ann. rheum. Dis.*, **23**, 45 (Rheumatoid arthritis in Liberia).
- Houba, V., and Allison, A. C. (1966). *Lancet*, **1**, 848 (M-antiglobulins (rheumatoid-factor-like globulins) and other gamma-globulins in relation to tropical parasitic infections).
- Kellgren, J. H., Jeffrey, M. R., and Ball, J. (editions) (1963). "The Epidemiology of Chronic Rheumatism", vol. 2, Blackwell, Oxford.
- Kibukamasoke, J. W. (1968). *E. Afr. med. J.*, **45**, 378 (Gout in Africans).
- Klein, F., and Mattern, P. (1965). *Ann. rheum. Dis.*, **24**, 458 (Rheumatoid factors in primary and reactive macroglobulinaemia).
- Kunkel, H. G., Simon, H. J., and Fudenberg, H. H. (1958). *Arth. and Rheum.*, **1**, 289 (Observations concerning positive serological reactions for rheumatoid factor in certain patients with sarcoidosis and other hyperglobulinemic states).
- Mohamed, S. D. (1966). *Lancet*, **1**, 1378 (Rheumatoid-factor-like globulins and tropical parasitic infections).

- Pallis, C. A., and Scott, J. T. (1965). *Brit. med. J.*, **1**, 1141 (Peripheral neuropathy in rheumatoid arthritis).
- Pène, P., Bernou, J. -C., Frament, V., and Kiese, F. (1965). *Bull. Soc. Med. Afr. Noire langue franç.*, **10**, 57 (A propos d'une observation de goutte polyarticulaire chez un Africain).
- Ropes, M. W., Bennett, G. A., Cobb, S., Jacox, R., and Jessar, R. A. (1959). *Ann. rheum. Dis.*, **18**, 49 (1958 Revision of diagnostic criteria for rheumatoid arthritis).
- Sankalé, M., Diop, B., Quénum, C., Frament, V., and Ancelle, J. -P. (1968). *Bull. Soc. méd. Afr. Noire langue franç.*, **13**, 82 (La goutte chez le noir africain à Dakar).
- Schmid, F. R., Cooper, N. S., Ziff, M., and McEwen, C. (1961). *Amer. J. Med.*, **30**, 56 (Arteritis in rheumatoid arthritis).
- Shaper, A. G., Kaplan, M. H., Mody, N. J., and McIntyre, P. A. (1968). *Lancet*, **1**, 1342 (Malarial antibodies and autoantibodies to heart and other tissues in the immigrant and indigenous peoples of Uganda).
- and Shaper, L. (1958). *E. Afr. med. J.*, **35**, 647 (Analysis of medical admissions to Mulago Hospital, 1957).
- Shepherd-Wilson, W., and Gelfand, M. (1962). *Cent. Afr. J. Med.*, **8**, 181 (Gout in the African).
- Short, C. L., Bauer, W., and Reynolds, W. E. (1957). "Rheumatoid Arthritis", Harvard University Press, Cambridge, Mass.
- Thompson, M. (1965). In "Progress in Clinical Rheumatology", ed. A. St. J. Dixon, p. 17. Churchill, London.
- Thould, A. K., and Simon, G. (1966). *Ann. rheum. Dis.*, **25**, 220 (Assessment of radiological changes in the hands and feet in rheumatoid arthritis).
- Trowell, H. C. (1947). *E. Afr. med. J.*, **24**, 346 (A case of gout in a Ruanda African).
- (1960). "Non-infective disease in Africa". Arnold, London.
- Valkenburg, H. A. (1963). In "The Epidemiology of Chronic Rheumatism", vol. 1, ed. J. H. Kellgren, M. R. Jeffrey, and J. Ball, p. 330 and 337. Blackwell, Oxford.
- Wells, J. V. (1967). *Med. J. Aust.*, **2**, 777 (Positive results to serological tests for rheumatoid factor in New Guinea).
- Wilkinson, M., and Torrance, W. N. (1967). *Ann. rheum. Dis.*, **26**, 475 (Clinical background of rheumatoid vascular disease).

La polyarthrite en Nigérie Occidentale

I. La polyarthrite rhumatoïde

RÉSUMÉ

Les signes cliniques de 71 malades adultes nigériens atteints de polyarthrite chronique qui ont satisfait les critères de l'Association Américaine du Rhumatisme pour faire un diagnostic certain ou probable d'arthrite rhumatoïde sont décrits. Ils ont été vus pendant une enquête sur les différentes formes de polyarthrite chez les malades se présentant à University College Hospital, Ibadan, Nigérie. Une incidence basse de nodules, de lésions vasculaires et de névrites périphériques a été trouvée. Le facteur rhumatoïde n'a pas été trouvé plus fréquemment que chez les témoins, les changements radiologiques étaient bénins, et le pronostic était bon. Il est suggéré que les malades avaient une forme distincte de polyarthrite chronique qui a une étiologie en relation au milieu tropical ou que leur arthrite rhumatoïde était modifiée de quelque façon par le milieu tropical.

Poliartritis en Nigeria Occidental

I. Poliartritis reumatoïde

SUMARIO

Se describen las características clínicas de 71 pacientes adultos nigerianos con poliartritis crónica que satisfacían el criterio de la Asociación Norteamericana del Reumatismo, de un diagnóstico de poliartritis reumatoïde definida o probable. Estos pacientes fueron examinados durante una investigación de la poliartritis, entre pacientes que acudían al University College Hospital, de Ibadán, Nigeria. Se descubrió una baja incidencia de nódulos, lesiones vasculares y neuritis periférica. Se halló que el factor reumatoïde no era más frecuente que en los testigos, los cambios radiológicos eran leves y la prognosis fue buena. Se sugiere que los pacientes padecían una forma evidente de poliartritis crónica que tiene una etiología vinculada al ambiente tropical o que padecían una poliartritis reumatoïde modificada, en cierto modo, por el ambiente tropical.