Rheumatoid arthritis in Ghana - A description of an inception cohort

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Abstract

Objectives: This study outlines disease characteristics in Ghanaian Rheumatoid Arthritis (RA) patients.
Design: A retrospective study.
Methods: The study was conducted by examining the records of 179 RA patients at the Korle-Bu Teaching Hospital Rheumatology Clinic between January 2013 and January 2015. Patient demographic, clinical and laboratory variables were obtained by chart review in a standard data collection form. Analysis was done using SPSS version 23. For all analysis, p values less than 0.05 were considered statistically significant.
Results: The male:female ratio was 1:4.59 with mean age of onset of 41.4 years and disease duration of 64 (12.8-140) weeks. Rheumatoid factor was positive in 78 (43.6%) and anti-cyclic citrullinated peptide in 100 (55.9%). Constitutional symptoms of fever and fatigue were common and anaemia was the most common extra articular feature.
Conclusion: In this first study of RA in Ghanaians, the key findings were similarities between our patients and other West African populations that mimic Caucasian populations in age, sex and joint distribution, a relatively low joint count, few extra articular manifestations and little nodal disease.

Key words: Rheumatoid arthritis, Sub-Saharan Africa, Geographic differences, Disease characteristics

Introduction

Rheumatoid Arthritis (RA) is a systemic autoimmune disease resulting in symmetrical chronic erosive inflammatory polyarthritis that results in joint destruction, disability and increase mortality as well as placing a significant burden on health care systems.

With an estimated global prevalence of 1%, RA is one of the most common chronic diseases[1,2]. RA is believed to have first been reported in Europe in the 17th century and subsequently described in the Americas among Native American Indians[3]. It was not until the middle of the 20th century that the first case of RA in Africa was described[4].

Despite being a leading cause of chronic morbidity in the developed world, little is known about the disease burden in Africa despite its potentially life threatening systemic manifestations and profound morbidity[2,5].

Majority of studies in Africa were concentrated in a few countries notably; South Africa, Nigeria and Uganda, with the majority of the continent having no available data. As a result the extent of the burden of RA in Africa is largely unknown[5]. Furthermore, most of the data for Africa has come from studies conducted between the 1950s and 1980s[6].

Variation in prevalence and incidence rates across different racial backgrounds has been noted, with differences in susceptibility, age, disease course, clinical expression, clinical and laboratory findings and this has been attributed to the possible influence of genetic and environmental factors.

We sought to examine a cohort of RA patients in Ghana to determine disease characteristics compared to other populations and this is the account of our findings.

Materials and methods

A retrospective study was conducted examining the records of the period of January 2013 to January 2015. We included patients diagnosed with rheumatoid arthritis according to the ACR criteria[7] at the Rheumatology Unit of the Korle-Bu Teaching Hospital. All patients met at least four of the ACR classification criteria for RA. Patients without complete medical details or follow up or those who did not meet RA ACR diagnosis criteria were excluded. The Ethics Committee of the Korle-Bu Teaching Hospital approved the study.

Information on patient demographic, clinical and laboratory variables over the course of disease was obtained by chart review, and collected in a standard data collection form created for that purpose. The clinical or laboratory variables were

registered as "present" or "absent" for each specific patient at the moment of diagnosis and then at any time during the course of the disease.

Statistical analysis: Descriptive statistical data was computed. Data analysis was done using SPSS version 23. Continuous variables were presented as means ± SD or Median (IQR). Categorical or nominal variables were expressed as proportions and compared using Chi-squared test or Fishers exact test as appropriate.

Results

One hundred and seventy nine patients with rheumatoid arthritis seen between the years 2013 to 2015 were evaluated. Females constituted majority 147 (82.1%) of patients and were mostly professionals and in the sales and trader sector of employment. Few people smoked in the cohort and alcohol use was low (Table 1).

Table 1: Socio demographic and clinical characteristics of rheumatoid arthritis patients

Socio-demographic variables	Frequency (n)	(%)
Sex (n=179)		
Male	32	17.9
Female	147	82.1
Occupation (n= 157)		
Administrative indoor	113	72.0
Outdoor	44	28.0
Smoking history (n=179)		
No	176	98.3
Yes	3	1.7
Alcohol use (n=179)		
No	153	85.5
Yes, but not significant use	26	14.5
Clinical characteristics	Frequency(n)	(%)
Medical history (n=179)		
None	143	79.9
Hypertension	23	12.8
Diabetes	2	1.1
Other	11	6.1
Parity (n =179)		
Para 0	154	86.0
Para 1 or more	25	13.9
Morning stiffness (n=179)		
No	99	55.3
Yes	80	44.7
Nodules (n=179)		
No	172	96.1
Yes	7	3.9
Oral ulcers (n=179)		
No	164	91.6
Yes	15	8.4
Fatigue (n=179)		
No	154	86
Yes	25	14
Malaise (n=179)		
No	169	94.4
Yes	10	5.6
Fever (n=179)		
No	138	77.1
Yes	41	22.9
Eye changes (n=179)		
No	174	97.2
Yes	5	2.8
Skin rash (n= 179)		
No	157	87.7
Yes	22	12.3
Selected demographic and clinical characteristics of all participants	Mean ± SD	
Duration from diagnosis in months (n=178)	64 (12.8, 140)*	
Age (years) (n=179)	44.7 ± 15.1	
Duration of symptoms (in weeks) (n=161) *	169 (79 -392)*	
Weight in(kg) (n=162)	62.3 ± 23.7	
Tender Joint Count (n=179)	2.0 ± 4.1	
Swollen Join Count (n=179)	2.1 ± 4.2	
Patient assessment of disease activity using VAS (n=178)	4.6 ± 2.6	

** Median (IQR*

The most common constitutional feature was morning stiffness found in 99 patients (55.3%) and fever found in 41 (22.9%). Few had nodal disease 7 (3.9%). The mean age was 44.7 (SD15.1), with mean disease duration of 64 (12.8-140) weeks. Duration from onset of symptoms till diagnosis was 169 weeks (79- 392).

The average Tender Joint (TJC) and Swollen Joint Counts (SJC) were 2.0 (SD±4.1) and 2.1 (SD±4.2) respectively. The mean Visual Analogue Score (VAS) for pain was 4.6 (SD±2.6). Rheumatoid factor was positive in 78 (43.6%) and ACPA was positive in 100 (55.9%).

Majority, 145/179 (81%) were on steroids (both oral/injectable) with 96 (53.6%) on methotrexate. One hundred and nine (60.9%) were on hematinic and 102 (57.0%) on hydroxychloroquine. The distribution of other medications is as shown in Table 2.

Table 2: Antibody profile and medications of rheumatoid arthritis patients

Laboratory	No.	(%)
Rheumatoid factor	78	43.6
Antinuclear antibodies	14	7.8
Anti Double-Stranded DNA	1	0.5
Extractable Nuclear Antigens	2	1.1
Ab to ENA - Scl-70	1	0.5
Ab to ENA - Ro(SS-A)	3	1.7
Ab to ENA - La(SS-B)	2	1.1
Ab to ENA - RNP	4	2.2
Anti-citrullinated protein/ peptide antibodies	100	55.9
High ESR(n=137)	115	83.9
High CRP(n=42)	17	40.5
Low Hemoglobin(n=142)	58	40.8
Low Total Protein(n=111)	97	87.4
Low Albumin(n=135)	25	18.5
Drugs		
Steroids(oral/injectable)	145	81.0
Hematinics	109	60.9
Proton pump inhibitors	103	57.5
Hydroxychloroquine	102	56.9
Methotrexate	96	53.6
ACE-Inhibitors	30	16.8
Sulfasalazine	24	13.4
NSAIDS	14	7.8
Azathioprine	11	6.1

**Multiple response analysis*

The site of joint involvement was not significantly associated with high ESR levels, though individuals with high ESR had 10% increased odds (cOR=1.1 95%CI=0.4–3.2) of having generalized joint involvement compared with those without evidence of synovitis in the joints.

Sex and site of joint involved were not significantly associated with high VAS independently. Higher proportion of females had high VAS compared to males (89.3% vs 10.7%) and individuals with generalized joint involvement also had a higher VAS compared to individuals with no evidence of synovitis, small or large joint involvement (60.7%, 7.1%,7.1% and 25% respectively).

Discussion

This study reports on 179 RA patients seen over a two-year period. Whilst this was not a prevalence study, it demonstrates similar trend of increasing reports from sub Saharan Africa. Females formed the majority of patients in our cohort accounting for 82.1% of those affected, with a female: male ratio of 4.59:1 similar to what has been reported in other African countries (Table 1). Female to male ratio seems to vary across countries, in 1995, female to male ratios in different African countries were similar to that of European whites (F/M ratio from 1.5:1 in Nigeria ranging to 3.7:1 in South Africa, compared to 2-4:1 in Europe)[8]. An Egyptian cohort showed a ratio of 6.7:1[9]. In Europe, a recent study in the United Kingdom found a female: male ratio of 2.64:1[10].

The age of Ghanaians with RA (41.4 years) is closer to that reported in Europeans/Caucasians compared to that of Africans populations. The mean age of onset has been found to be consistently lower in Africans compared to Caucasians (36 years in Africans compared to 44 years in Caucasians). This may be due to socioeconomic factors and differences in life expectancy[11]. The elderly population is significantly less in African countries, which will presumptively decrease the mean age of diagnosis, as fewer people live long enough to experience "late-onset" RA.

Morning stiffness >1 hour was experienced by 55% of our patients. Nearly 90% of people with active RA experience morning stiffness, according to a 2014 review in the journal BioMed Central Musculoskeletal Disorders[12]. It is possible therefore a low prevalence of morning stiffness may lead to under diagnosis of RA in Ghana.

Fatigue was experienced by a small minority (14%) of our patients in keeping with the observation that this symptom is underrepresented in developing countries[13]. These dual observations suggest that a proportion of cases of RA in Ghanaians reside in the milder spectrum of disease. This notion is supported by the relatively low tender and swollen joint counts (2) and RA nodules (7/179).

Nodules are usually a sign of advanced RA and are also more common in anti CCP and Rheumatoid factor positive patients as well as those who smoke[14-16]. Our research involves a young cohort with short disease duration and only 43.6% were RF positive and 55.86% being ACPA positive. RA has been said to be milder in Africans from studies in Nigeria, South Africa, Zimbabwe, Congo-with fewer extra-articular features, less subcutaneous nodule formation, younger age of onset and less radiological damage compared to Caucasians and other black populations from elsewhere[17-21]. However more recent studies suggest that RA is likely than previously thought,

to be more common and be more severe in the black races of sub Saharan Africa[22-24].

In African populations the diagnostic value of ACPA remains secure despite the finding of low numbers of the Shared Epitope (SE) and low numbers of smokers, signifying that other factors may influence ACPA positivity in Africans (37). However the specificity of IGM RF as a diagnostic tool is diminished due to the high percentage of positive tests in a population with a the high background of chronic infection.

Early diagnosis and treatment influence disease outcome in RA with a window of opportunity in the region of 3-6 months only to commence effective treatment. Adverse outcomes are likely when this target is not achieved.

Duration from onset of symptoms to diagnosis was 169 weeks (approximately 39 months) in this Ghanaian cohort. This prolonged delay in diagnosis of RA is a feature of many African studies. This reality reflects an educational gap about the disease among health care providers, a gross scarcity of rheumatologists and the fact that many patients resort to alternative health care providers before seeking a medical opinion[24].

The patients in our study were mainly from a middle income group treated with standard DMARDs. In many African nations, medication cost and monitoring may limit access to DMARDs leading to delayed presentation and adverse outcomes for some. Moreover the pervasive use of steroids (as in our cohort) may result in the amelioration of symptoms, leading to long lag time to diagnosis and referral[24].

This study was limited by the fact that the data was retrospective leading to some missing values. We could not calculate activity scores e.g. DAS 28 or determine radiological scores eg Sharp score which would have provided more detailed information about disease activity and disability.

Conclusion

In this first study of RA in Ghanaians, the key findings were similarities between our patients and other West African populations in age, sex and joint distribution, a relatively low joint count, few extraarticular manifestations and little nodal disease. More studies need to be conducted to estimate the true burden and patterns of RA in Africans so that appropriate health policies can be implemented.

Declarations

Ethical approval: Ethics approval was not required at the time data set was collected for retrospective studies.

Data: Data and materials are available on request.

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Conflict of interest: The authors have no competing or conflict of interest to report.

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