The epidemiology of rheumatoid arthritis in Kinshasa, Democratic Republic of Congo—a population-based study

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Abstract

Objective. To determine the prevalence of RA and its distribution among linguistic groups in the urban area of Kinshasa.

Methods. Investigators questioned all individuals living in randomly chosen streets in five randomly chosen health areas in Kinshasa. Age, sex, linguistic group and rheumatic complaints were noted. RA diagnosis by 1987 ACR classification criteria was checked in all suspect cases. Disease activity (DAS-28), functionality (HAQ), X-ray damage, ACPA and RF positivity were assessed in patients confirmed with RA.

Results. A total of 5000 individuals were questioned, with 2700 females and 2300 males [average age 25.7 (1.8) years]. Linguistic group definitions were obtained in 4587 subjects: 44.3% had Kongo roots, 16.9% Ngala, 16.7% Luba, 11% Swahili, 3.6% Tetela and 7.6% miscellaneous. Thirty persons (age ±53 years) fulfilled the ACR criteria with a female/male sex ratio of 5. Mean age at disease onset was 47.7 years. Kongo people had the highest RA prevalence (1%). Mean DAS-28 was 6.5, mean HAQ was 1.3. One-third of patients were RF and ACPA positive and had classical X-ray findings.

Conclusion. The prevalence of RA in Kinshasa is 0.6 and 0.9% in people aged >18 years. Disease activity was high, but RF and ACPA positivity was not frequent. The Kongo seems to be the most affected linguistic group.

Key words: rheumatoid arthritis, epidemiology, Africa.

Introduction

RA is the most extensively studied inflammatory rheumatic disease worldwide. Its prevalence in Western populations is ±1%, and may reach 5% in Pima and Chippewa Indians [1, 2]. The disease appears mainly between age 30 and 50 years and has a female/male sex ratio of ±3/1. In sub-Saharan Africa, few and only old epidemiological data are available, reporting a low prevalence. This is the case for studies in South Africa in the rural population of Tswana [3], in the rural ethnicity of Sotho in Lesotho [4], in West Africa [5] and in Nigeria [6]. A study in urban South Africa described a prevalence close to what is observed in Europe and North America [7]. In the Democratic Republic of Congo (DRC) to date no population study has been conducted. Hospital data suggest that RA is rare in patients attending the rheumatology units of Kinshasa [8–10]. The present study has been performed to determine the prevalence of RA in Kinshasa, to describe disease characteristics and to value the influence of ethnic roots in the occurrence of RA.

Patients and methods

This is a cross-sectional study conducted from 16 October to 14 November 2010. Kinshasa has >7 million inhabitants and counts 35 health divisions, each subdivided into health areas corresponding to administrative districts, with a total of 374 areas. Five areas were randomly selected: Cité-Verte (Cv) with 11 150
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inhabitants, Dondo (D) 12 850 inhabitants, Kalamu II (Ka) 4812 inhabitants, Libulu (Li) 16 466 inhabitants and Mama Yemo (My) 27 000 inhabitants. In each of the health areas, streets were randomly selected and investigators went from house to house to conduct a census of residents and specify their age, sex and ethnic/linguistic affiliation. This study was authorized by the provincial inspectorate of health and the agreement of all persons/families examined was obtained. There was no written informed consent, as many people in this epidemiological study were not able to read or write. Thus it was done orally after the information had been given.

Five thousand people formed the study sample. The number of study subjects in each health area was proportional to the number of inhabitants: Cv 771, D 889, Ka 333, Li 1139 and My 1868. Ten assistants performing the screening were physicians in training for internal medicine for >2 years and with at least 6 months of training in rheumatology. They were specifically trained for this study by a rheumatologist. Several questions were asked: Do you have joint pain? Where? At which moment of the day? For how long? What’s the duration of morning stiffness? RA was suspected when the investigator judged the patient fulfilled at least two clinical criteria of the ACR 1987. All suspected cases were evaluated at the university hospital of Kinshasa to confirm the diagnosis according to these criteria. None of these was previously followed and treated for RA. The medical investigation included a clinical examination by a rheumatologist (J.J.M.), X-rays of hands and feet (erosions, joint space narrowing, juxta-articular osteoporosis), as well as RF by the latex test and ACPAs.

Results

The population studied consisted of 5000 persons with an average age of 25.7 (1.8) years (2 weeks–83 years); 3193 persons were at least 18 years old, of whom 1761 were females and 1432 were males. The female/male sex ratio was 1.2 and their average age was 35.2 (14.8) years. The linguistic characteristics were determined for 4587 people of whom 2031 Kongo, 774 Ngala, 764 Luba, 505 Swahili and 513 belonging to miscellaneous ethnicities including 163 Tetela (3.6% of the population with known ethnicity).

 Fifty-three suspected cases were identified. After evaluation 23 cases were excluded for not fulfilling the ACR criteria. Nine presented paresthesias that were reported by mistake as pain because of the local languages using the same words for pain and paresthesia; seven persons had joint pain without swelling or inflammatory signs; five had symmetric arthritis affecting large joints <6 weeks; and in two cases a symmetric arthritis affecting feet and hands was observed with morning stiffness reported for <6 weeks, normal X-rays and absence of RF. In total, 30 cases were selected based on ACR criteria (1987). No cases of diseases resembling RA (such as psoriatic arthritis) were found. The prevalence of RA in Kinshasa can therefore been estimated at 0.9% of people aged ≥18 years, and 0.6% of the global population. Fig. 1 summarizes the evaluation process.

![Fig. 1 Selection of RA patients in the population studied.](www.rheumatology.oxfordjournals.org)

Of the patients diagnosed with RA, 25 were female and 5 were male. Their average age was 53 (1.6) years (28–80 years). Patients reported having symptoms for ±3.6 years (6 months–8 years) and the mean age at disease onset was 49.4 years. Eighteen (60%) patients were between 30 and 50 years old at disease onset. The prevalence by age group is detailed in Table 1.

All patients had symmetric arthritis, hand arthritis and the involvement of at least three joint groups; 26/30 reported morning stiffness of >1 h. Two had classical RA nodules. The mean value of ESR was 60 mm/h, the mean DAS-28 and HAQ were 6.5 and 1.3, respectively. Ulnar deviation of the hand and swan neck deformity were seen in one patient. Radiographs of hands and feet were obtained for 24 patients and showed juxta-articular osteoporosis in 11 (45.8%), classical erosions in 7 (29.2%) and joint space narrowing in 8 (33.3%) patients. Normal X-rays were seen in 13 (54.2%) patients. RF and ACPA could be determined in 24 patients and were positive in 8 (33.3%) of them. Patients in whom X-rays, RF and ACPA were available were not different regarding age and clinical characteristics compared with those without. Of all RA patients the majority (21) were of the Kongo ethnicity (70%), 4 (13.3%) were Luba, 3 (10%) Swahili, 1 Ngala and 1 person belonged to another ethnicity (Tetela).

The prevalence of RA was highest in persons of Kongo origin (21/2031 = 1%) followed by those of Swahili (3/505 = 0.6%), Luba (4/764 = 0.5%) and Ngala (1/774 = 0.13%) ethnicity. The prevalence in persons of
This study has the merit of being the first in the DRC to provide information about the epidemiology of RA in a city where virtually all ethnicities of DRC are represented, even though people from the Kongo linguistic group are more preponderant due to the proximity of their province of origin to Kinshasa.

Forty-four per cent (23 of 53 patients) of suspected individuals were excluded for not fulfilling ACR 1987 classification criteria of RA. Language sometimes lacked precision, highlighting the problem of lack of validation of definitions and measures in different parts of the world. There is also a problem with the concept of time in many Congolese people, so we had to clarify the duration of morning stiffness and clinical manifestations during our evaluations.

The result of the present study is not in agreement with hospital-based studies that have reported the rarity of RA [8–10], recalling the weakness of clinical observations. The female/male sex ratio of 5 observed in this study is higher than what is mentioned in the literature; the age of onset of the disease is similar to what is reported generally in the literature. It would be interesting to evaluate the role of genetic predisposition also in this part of the world. The fact that the prevalence of RA is higher in the Kongo linguistic group than in the others might suggest a greater genetic susceptibility. Ngala would be less predisposed to develop RA. Given the small number of cases in different linguistic groups, this must be considered with caution. It will be relevant in the future to conduct a similar epidemiological study on a large scale in the provinces of origin of the different linguistic groups, adding an evaluation of susceptibility genes. Potential differences between the pattern of the disease in rural and urban areas might be evaluated at the same time to replicate findings in older studies [7].

This study indicates that RA is relatively mild in Congolese patients, given the scarcity of clinical signs of severity such as deformities, rheumatoid nodules and radiological erosions. These findings corroborate those of a clinical study that we currently are carrying out on the phenotype of RA among patients followed in the University Hospital of Kinshasa. This paucity of radiological destruction and the relatively high rate of seronegative RA has also been reported in a previous clinical study [8]. The determinants of this phenotype are not clear: is it a protective gene or an environmental factor?

The prevalence of RA is apparently not low in the DRC and it is certainly important to study this further, but future initiatives should take into account specific aspects of health care in central Africa, and our traditional evaluation tools and definitions need to be better validated for use in this area of the world.

### Discussion

This study indicates a prevalence of RA in Kinshasa of 0.9% in the population more than 18 years old with a female/male ratio of 5. RA starts in people between the ages of 30 and 50 years. The mean age of the population of Kinshasa is very young (25 years). With a high birth rate, the life expectancy of Congolese is low and estimated at 52.2 years for males and 55.8 years for females [11]. The prevalence of RA in the overall population of 0.6% found in this study is therefore not ideal to compare with worldwide estimations [1], but the prevalence in people aged over 18 years is similar to what is actually reported in Western countries. In the latter, a decrease in RA prevalence has been reported in more recent years [12]. Prevalence in Kinshasa is higher even than in a recent study in France, where it is actually 0.4% [13].

Taking into account the lower life expectancy of people, the prevalence of RA therefore seems about similar in this urban region of Central Africa compared with Europe and North America. In Kinshasa, 44.3% of the population belong to the Kongo linguistic group. The disease is found in 1% of Kongo people and less in other ethnicities. More than 400 ethnic groups live in DRC and most of them have their own dialect. Ethnicities living in the same province or in neighbouring provinces have a similar overarching language, the same traditions and culture and a similar history, explaining why they constitute a linguistic group.

The mean disease activity was high, with an important functional impact, but joint deformities and typical joint damage on X-rays were not frequent, even with a disease duration of 3.6 years. RF, ACPA and X-ray involvement were only observed in one-third of the patients, which is different from findings in Western countries. The cross-sectional character of this study could lead us to consider patients as non-RA cases although they could become classical RA patients after some time. However, the average duration of symptoms was almost 4 years. This study has the merit of being the first in the DRC and one of the few in recent years in sub-Saharan Africa to provide information about the epidemiology of RA in a city where virtually all ethnicities of DRC are represented.
Acknowledgements

The authors would like to thank the assistants helping with the enquiries: A. Bakebe, B. Bepouka, M. Ciasuma, J. P. Kimpiatu, P. Lebughe, A. Lukusa, J. D. Manyebwa, T. Mukendi, C. Mulumba and G. Ngoy.

Funding: This work has been partly funded by the non-restricted Pfizer travel grant 2010 from the FWRO-FRSR of the Royal Belgian Society of Rheumatology.

Disclosure statement: The authors have declared no conflicts of interest.

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