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Spondyloarthritis in the Democratic Republic of the Congo: a prospective hospital-based study

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ABSTRACT

Objectives To determine the spectrum of spondyloarthritis (SpA) in outpatients with symptoms of rheumatism attending two rheumatology practices in the Democratic Republic of the Congo.

Design A descriptive prospective multicentre outpatient study.

Setting The present study analysed 6 months data (from 1 December 2012 till 31 May 2013).

Participants Nine hundred and eighty-four consecutive outpatients were studied.

Primary and secondary outcome measures A clinical diagnosis of SpA was made and several classification criteria were applied afterwards. Radiographic lesions in the sacroiliac joint were scored with the modified New York criteria. BASDAI and BASFI were evaluated in axial SpA (axSpA). The primary end point was the prevalence of SpA and the secondary end points were the spectrum of SpA and its subtypes.

Results One hundred and five patients (10.7%) were diagnosed among 984 consecutive outpatients with a sex ratio (male to female) of 1.4. The average age at disease onset was 41.3±12.4 years. Non-radiographical axSpA was the most frequent subtype (5.0%) followed by reactive arthritis (4.3%). Other subtypes were: ankylosing spondylitis (1.0%), psoriatic arthritis (0.1%), synovitis, acne, pustulosis, hyperostosis, osteitis syndrome (0.1%) and inflammatory bowel disease-associated arthritis (0.1%). Mean BASDAI and BASFI in axSpA were 42.7/100 and 46.4/100, respectively. Peripheral enthesitis was found in 43% of patients with SpA and uveitis (10.4%) was the most frequent extra-articular manifestation. We did not detect any family history. Median erythrocyte sedimentation rate and C reactive protein were 37 (range: 7–110) mm/hour and 22 (range: 4–48) mg/L, respectively.

Conclusions This hospital-based study suggests there is substantial occurrence of some subtypes of SpA in central Africa. A population-based study is needed to evaluate these subtypes.

Strengths and limitations of this study

- To the best of our knowledge, this is the first more detailed study describing the spectrum of spondyloarthritis (SpA) in the Democratic Republic of the Congo.
- In this hospital-based study, clinical diagnosis was followed by diagnostic criteria applied by rheumatologists, thus strengthening the results, while the application of classification in medical records might have led to misdiagnosis.
- HLA typing and MRI were not performed due to lack of availability and economic constraints. On the other hand, applying classical Assessment of SpondyloArthritis International Society criteria to an African population would perhaps not be accurate and specific validation is needed in our population.
- Relationships with sexually transmitted and other infections are lacking in our study and future work needs to draw attention to this important issue.
- A population-based study will be needed to accurately evaluate the phenotype and genotype of SpA in central Africa.

INTRODUCTION

Spondyloarthritis (SpA) is a heterogeneous group of mostly chronic, inter-related, inflammatory rheumatic diseases that share a common genetic predisposition and specific clinical characteristics such as spinal inflammation, asymmetrical peripheral arthritis, dactylitis and enthesitis,[1] and common extra-articular features such as uveitis, psoriasis and inflammatory bowel disease (IBD).

Based on the 'Assessment of SpondyloArthritis International Society' (ASAS) classification criteria, SpA can be divided into two subsets: axial SpA (axSpA) including ankylosing spondylitis (AS) and non-radiographical axial spondyloarthritis (nr-axSpA) and peripheral SpA (pSpA), including reactive arthritis (ReA), psoriatic arthritis (PsA), enteropathic arthritis and juvenile SpA.[2]

The spectrum of SpA in sub-Saharan Africa remains poorly defined. In the African black populations, SpA is considered to be extremely rare, which can be explained in part by the low prevalence of HLA-B27.[3–6] A completely different environment on top of a different genetic background might also be responsible for the rarity as well for a different disease presentation.[7–11] Few

studies have reported on the epidemiological, clinical and radiological features of SpA in sub-Saharan populations.[3–6 12] These studies are mostly older, biased because they are based on hospital cohorts, and suggest differential epidemiological and clinical aspects of SpA in the region. In the Democratic Republic of the Congo, data on SpA are also scarce. A first hospital-based study reported a prevalence of 7.5% among patients attending the University Hospital of Kinshasa (UHK) for symptoms of rheumatism.[13] The purpose of this present study was to report in a more detailed way the spectrum of SpA and its subtypes in patients attending two rheumatology units in the Democratic Republic of the Congo.

METHODS

This was a prospective study conducted in the department of internal medicine of the UHK and the Provincial General Hospital of Kinshasa (Kinshasa, the Democratic Republic of the Congo, Africa) for 6 months, from 1 December 2012 till 31 May 2013.

These two hospitals were chosen because of the existence of a rheumatology unit. In the Democratic Republic of the Congo there are no other rheumatology units and in total five rheumatologists are working in Kinshasa. Patients with symptoms of rheumatism do not have access to healthcare because of problems in the organisation of care as well as the lack of a health insurance system.

All the patients visiting the outpatients' clinics of these hospitals for symptoms of rheumatism during the study period were recruited consecutively. A complete clinical examination by the rheumatologist was performed. Details of joint symptoms, back pain and stiffness, personal and family histories of arthritis, skin lesions, symptoms of acute anterior uveitis, enthesitis, dactylitis, Crohn's disease/colitis, diarrhoea, urethritis, good response to non-steroidal anti-inflammatory drugs and a positive family history of SpA were recorded. The diagnosis of SpA was according to Amor and ESSG criteria. When the criteria were not fulfilled, the rheumatologist could still make the diagnosis according to his clinical experience. AxSpA and pSpA were diagnosed when predominant involvement was, respectively, in the axial skeleton and the peripheral joints, consisting of peripheral arthritis, enthesitis and dactylitis. AxSpA was categorised into AS and nr-axSpA according to the presence/absence of radiographic sacroiliitis.[14 15] The diagnosis of AS has been based on the modified New York criteria. PsA diagnosis was according to the CASPAR classification.[16] All patients with buttock pain and/or low back pain underwent image evaluation of the pelvis in anterior-posterior view by conventional X-rays. Others joint X-rays were performed when additional manifestations were present (peripheral arthritis, enthesitis and dactylitis). Patients with axSpA were also asked to complete BASDAI and BASFI.[17] All patients were assisted by rheumatologists in completing the two questionnaires. For the patients who had difficulty understanding the French language, the rheumatologist proceeded to a translation in Lingala to explain the different questions contained. Blood tests including erythrocyte sedimentation rate (ESR) and the serum C reactive protein (CRP) were also performed in all patients. HLA-B27 typing was not realised.

Qualitative data are described as n (%) and quantitative data as mean (SD) or median (quartile1–quartile3), as appropriate. χ^2 test was used for the comparison of the proportions. A Student's t-test was used to compare the averages. The p value was fixed at 0.05.

RESULTS

During the study period, 984 patients visited one of the rheumatology units for s ymptoms of rheumatism. The diagnosis of SpA was made in 105 patients (10.7%). Seventy-eight patients fulfilled the Amor or ESSG criteria and 27 patients were diagnosed on clinical grounds, based only on the rheumatologist's experience. The frequencies for the retrospective subtypes were 5.0% for nr-axSpA, 4.3% for ReA, 1.0% for AS. One patient was seen with PsA, synovitis, acne, pustulosis, hyperostosis, osteitis syndrome syndrome or IBD-associated arthritis. Sixty-two patients (59%) were male with a male/female sex ratio of 1.4. The mean age of the patients was 44.7±13.5 years; their median disease duration was 3.6 years (range: 0.3–15 years). Their average age at the onset of symptoms was 41.3±12.4 years. Table 1 reports the different types of SpA encountered. Inflammatory back pain (86.2%) and buttock pain (72.4%) were the most frequent symptoms seen in axSpA while asymmetrical oligoarthritis (80.8%) and plantar talalgia (66.0%) were the most frequently encountered features in pSpA. Table 2 shows the demographic and clinical data, and clinical assessment scores of patients with axSpA. Fifty-nine patients (56.2%) presented with axSpA and all of them had standard

Table 1 Different subtypes of spondyloarthritis (SpA) in University Hospital of Kinshasa and Provincial General Hospital of Kinshasa

Subtypes of SpA	*N* (Rf)	Sex distribution			P values	Mean age (years)±SD
		M	F	Ratio		
Nr-axSpA	49 (46.7)	27	22	1:0.8	0.23	40.5±7.5
ReA	42 (40.0)	20	22	1:1.1	0.47	40.2±13.1
AS	10 (9.5)	6	4	1:0.7	0.45	46.2±4.7
PsA	1 (1.0)	0	1			32
SAPHO syndrome	1 (1.0)	1	0			35
Enteropathic arthritis	1 (1.0)	0	1			25
Juvenile SpA	1 (1.0)	1	0			13

AS, ankylosing spondylitis; F, female; M, male; N, total number of patients with SpA; nr-axSpA, non-radiographical axial spondyloarthritis; PsA, psoriatic arthritis; ReA, reactive arthritis; Rf, relative frequency to total number of patients with SpA; SAPHO syndrome, synovitis, acne, pustulosis, hyperostosis, osteitis syndrome.

Table 2 Demographic and clinical features of patients with axSpA

	axSpA (total group, n=59)	nr-axSpA (n=49)	AS (n=10)	P values
Age, mean±SD years	45.6±6.1	41.5±7.5	48.2±4.7	0.03
Age of onset ± SD years	38±4.5	37.2±5.6	40.1±6.3	0.27
Male sex	33 (55.9)	27 (55.1)	6 (60.0)	0.45
Symptom duration >5 years	38 (64.4)	18 (36.7)	9 (90.0)	0.02
Clinical features				
Peripheral arthritis	18 (30.5)	16 (32.7)	2 (20.0)	0.23
Enthesitis	13 (22.4)	10 (20.4)	3 (30.0)	0.43
Uveitis	9 (15.5)	6 (12.2)	3 (30.0)	0.22
Psoriasis	1 (1.7)	1 (1.9)	0 (0.0)	
IBD	1 (1.7)	1 (1.9)	0 (0.0)	
BASDAI	42.7±9.2	39±11.4	44±15.5	0.42
BASFI	46.4±12.9	44.5±13.8	48.2±10.2	0.53
ESR (mm/hour) median, range	37 (7–110)	36 (7–68)	41 (13–110)	0.40
CRP (mg/L) median, range	22(4-48)	20 (6–48)	26 (6–48)	0.26

AS, ankylosing spondylitis; axSpA, axial spondyloarthritis; CRP, C reactive protein; ESR, erythrocyte sedimentation rate; IBD inflammatory bowel disease; nr-axSpA, non-radiographical axial spondyloarthritis.

radiographs of sacroiliac joints. Ten patients (6 male and 4 female) showed radiographic sacroiliitis as defined by the modified New York criteria and thus classified as AS while 49 patients (27 male) with axSpA (83.1%) had an absence of radiographic sacroiliitis so defined as nr-axSpA. Table 2 reports demographic and clinical characteristics of patients with axSpA. Patients with AS complained of chronic low back pain for 8.4±3.2 years compared with 4.7±3.3 years for patients with nr-axSpA (p<0.01). All patients with axSpA had inflammatory back pain according to ASAS criteria. One patient presented with dorsolumbar pain. The mean distance C7-wall was 4.5±1.6 cm with extremes of 3 cm and 8 cm. The mean distance between the nape and the wall was the Schöber Index of 10+4.2 cm (SD 3.2 cm). Six patients had radiographic sacroiliitis at stage 2 bilateral and four patients had radiographic sacroiliitis at stage 3 according to the modified New York criteria. Other radiographic findings were, in particular, signs of iliac and ischiopubic enthesitis in five cases. Syndesmophytes were present among five patients while no hip joint involvement was found in the standard radiographs. Elevated CRP and ESR values were found in 75.5% and 36.7% of patients with nr-axSpA, respectively; 80.0% and 40.0% of patients with AS had an elevated CRP and ESR, respectively. In the 42 patients with ReA (20 male and 22 female), 21 had urogenital manifestations, 17 had enteropathic manifestations and 4 patients had a classical Reiter's syndrome with articular, ocular and urogenital manifestations. Any idea about the bacteria was found in this study. The only case of PsA was found in a 32-year-old patient developing psoriasis 3 years earlier than the onset of articular features with asymmetrical oligoarthritis in the upper limb and typically in the distal interphalangeal joints. Altogether, extra-articular manifestations encountered were uveitis (12.4%), enterocolopathy (1.0%), pustulosis (1.0%) and psoriatic lesions (1.0%). No family history of SpA was found.

DISCUSSION

The prevalence of SpA was 10.7% among patients with symptoms of rheumatism during the 6-month period of the current study and is higher than that found by Malemba *et al* (7.5%) based on an extensive review of patients' medical records seen by rheumatologists at UHK. In this hospital-based study, diagnostic criteria applied by rheumatologists were used to improve their clinical diagnosis while just application of the Amor and ESSG criteria in medical records could have led to misdiagnoses. Moreover, in our environment, HLA typing is not feasible and because of the low frequency of HLA B27, the performance is not very good. We would state that ESSG and Amor criteria would also need specific validation studies in our region. The issue of HLA B27 mentioned above and the lack of availability of MRI in our regions as well the economic constraints, make the application of the ASAS criteria that heavily rely on these items, not feasible as is probably also the case in many other parts of the world. We observed 105 cases of SpA and a male/female sex ratio of 1.4. More men were affected overall as confirmed in most of the literature reported from Africa and the western countries.[6 18–21] The mean age and the age of onset of symptoms were higher than in the series reported in western countries, but were in agreement with the literature reported from the sub-Saharan region.[4 6 18–21] A completely different environment (differences in sanitary equipments, differences in infections occurring in these populations) on top of a different genetic background might be responsible for a different disease presentation and perhaps also later diagnosis, as a consequence.[7] One might overlook specific clinical presentations, and as already mentioned, classical classification criteria are not validated in this region. It is also necessary to underline the relatively long delay between the onset of symptoms and the consultation as found by several African authors, explained mainly by the poverty of the population and problems regarding healthcare in this part of the world.[20] The high frequency of endemic infectious diseases in tropical areas and the precariousness of community and individual measures of hygiene would explain the high frequency of ReA. Despite occurring frequently, ReA in our region is expected to present with milder clinical features probably because of a protective

role played by the local genetic factors.[7 8] Further genetic research in this field would be interesting. In this study we observed 10 cases of AS (1.0%). This scarcity seems to be related to the low frequency of the HLA B27 gene in this population.[22] Less male predominance of SpA, AS and nr-axSpA has been observed among Congolese patients compared with Caucasians.[3] However different demographical and methodological characteristics could also help explain the gender differences observed. The proportion of women could be underestimated because most patients with pelvic inflammatory disease would be seen in gynaecology departments in our country where full rheumatological evaluations and sacroiliac radiographs are not systematically performed. Patients with AS had a mean age of 48.2 years (SD 4.7) with the age of onset typically older as reported in other sub-Saharan literature and with no family history of SpA, and also a relative rarity of extra-articular features, notably uveitis, also in accordance with data of the literature of SpA in sub-Saharan Africa.[4 6 20 21]

Pertinent differences between AS and nr-axSpA (83.1% of axSpA) in this study included significantly longer disease duration and greater mean age at consultation for AS ($p<0.05$). Apart from the fact that AS develops after an initial period of disease with negative radiographical findings, this longer disease duration before consultation can also be explained by the many problems concerning organisation of healthcare, the poverty of the Congolese population having no access to treatment, as well as by cultural specificities with difficulties in understanding the concept of chronicity of a disease.[23] No significant difference was observed regarding extra-articular features, parameters of disease activity and function, as well as inflammatory markers including BASDAI, BASFI, ESR and CRP between these two groups. This is, of course, difficult to judge in a cross-sectional study of different disease entities when AS might be just the 'natural evolution' of nr-axSpA.[24–26] Only one case of PsA was reported in this study in a woman aged 32 years with HIV negativity. The skin lesions antedated the joint symptoms for 3 years, including peripheral joint involvement and sacroiliitis. This scarcity of psoriasis and PsA is in accordance with literature reports from sub-Saharan Africa.[3 4 6 20 21] Further studies must be performed both in rheumatology and dermatology to identify case ascertainment of PsA in this spectrum in the Congolese population.

CONCLUSION

SpA is not rare in outpatients attending rheumatology units in the Democratic Republic of the Congo. A population-based study would improve the understanding of this disease spectrum in central Africa. Such a study will need to take into account the differential infectious background, problems related to the healthcare system and poverty of the population, and differential genetics in this environment. Classification criteria validated in the western world will not necessarily perform the same in this region. Also measurements such as BASDAI and BASFI should be critically evaluated and compared with specific norm data.

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Collaborators Thierry Lusiense MD.

Contributors PL wrote protocol, recruited and enrolled participants, collected data, and drafted the report. JJM analysed and interpreted the data. J-MM-M served as experienced rheumatologist, participated in the design and helped to draft the manuscript. KdV and RW helped interpret data, and wrote and edited the final version of the manuscript. PL had full responsibility for the integrity of the data and the accuracy of the data analysis.

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REFERENCES

1. Sieper J, Rudwaleit M, Khan MA, *et al*. Concepts and epidemiology of spondyloarthritis. *Best Pract Res Clin Rheumatol* 2006;20:401–17.
2. Rudwaleit M, van der Heijde D, Landewe R, *et al*. The development of Assessment of SpondyloArthritis international Society classification criteria for axial spondyloarthritis (part II): validation and final selection. *Ann Rheum Dis* 2009;68:777–83.
3. Stolwijk C, van Onna M, Boonen A, *et al*. Global Prevalence of Spondyloarthritis: A Systematic Review and Meta-Regression Analysis. *Arthritis Care Res* 2016;68.
4. Tikly M, Njobvu P, McGill P. Spondyloarthritis in sub-Saharan Africa. *Curr Rheumatol Rep* 2014;16:421.
5. Rachid B, El Zorkany B, Youseif E, *et al*. Early diagnosis and treatment of ankylosing spondylitis in Africa and the Middle East. *Clin Rheumatol* 2012;31:1633–9.
6. Mijiyawa M, Oniankitan O, Khan MA. Spondyloarthropathies in sub-Saharan Africa. *Curr Opin Rheumatol* 2000;12:281–6.
7. Cao K, Moormann AM, Lyke KE, *et al*. Differentiation between African populations is evidenced by the diversity of alleles and haplotypes of HLA class I loci. *Tissue Antigens* 2004;63:293–325.
8. Mathieu A, Paladini F, Vacca A, *et al*. The interplay between the geographic distribution of HLA-B27 alleles and their role in infectious and autoimmune diseases: a unifying hypothesis. *Autoimmun Rev* 2009;8:420–5.
9. Brown MA, Jepson A, Young A, *et al*. Ankylosing spondylitis in West Africans--evidence for a non-HLA-B27 protective effect. *Ann Rheum Dis* 1997;56:68–70.
10. Solomon L, Beighton P, Valkenburg HA, *et al*. Rheumatic disorders in the South African Negro. Part I. Rheumatoid arthritis and ankylosing spondylitis. *S Afr Med J* 1975;49:1292–6.
11. Díaz-Peña R, Blanco-Gelaz MA, Njobvu P, *et al*. Influence of HLA-B*5703 and HLA-B*1403 on susceptibility to spondyloarthropathies in the Zambian population. *J Rheumatol* 2008;35:2236–40.

12. Singwe-Ngandeu M, Meli J, Ntsiba H, *et al*. Rheumatic diseases in patients attending a clinic at a referral hospital in Yaounde, Cameroon. *East Afr Med J* 2007;84:404–9.
13. Malemba JJ, Mbuyi-Muamba JM. Clinical and epidemiological features of rheumatic diseases in patients attending the university hospital in Kinshasa. *Clin Rheumatol* 2008;27:47–54.
14. Rudwaleit M, Landewé R, van der Heijde D, *et al*. The development of Assessment of SpondyloArthritis international Society classification criteria for axial spondyloarthritis (part I): classification of paper patients by expert opinion including uncertainty appraisal. *Ann Rheum Dis* 2009;68:770–6.
15. Rudwaleit M, van der Heijde D, Landewé R, *et al*. The development of Assessment of SpondyloArthritis international Society classification criteria for axial spondyloarthritis (part II): validation and final selection. *Ann Rheum Dis* 2009;68:777–83.
16. Taylor W, Gladman D, Helliwell P, *et al*. Classification criteria for psoriatic arthritis: development of new criteria from a large international study. *Arthritis Rheum* 2006;54:2665–73.
17. Calin A, Garrett S, Whitelock H, *et al*. A new approach to defining functional ability in ankylosing spondylitis: the development of the Bath Ankylosing Spondylitis Functional Index. *J Rheumatol* 1994;21:2281–5.
18. Dean LE, Jones GT, MacDonald AG, *et al*. Global prevalence of ankylosing spondylitis. *Rheumatology* 2014;53:650–7.
19. Usenbo A, Kramer V, Young T, *et al*. Prevalence of Arthritis in Africa: A Systematic Review and Meta-Analysis. *PLoS One* 2015;10:e0133858.
20. Belachew DA, Sandu N, Schaller B, *et al*. Ankylosing spondylitis in sub-Saharan Africa. *Postgrad Med J* 2009;85:353–7.
21. Ouédraogo DD, Meyer O. Psoriatic arthritis in Sub-Saharan Africa. *Joint Bone Spine* 2012;79:17–19.
22. Mbayo K, Mbuyi-Muamba JM, Lurhuma AZ, *et al*. Low frequency of HLA-B27 and scarcity of ankylosing spondylitis in a Zairean Bantu population. *Clin Rheumatol* 1998;17:309–10.
23. Lebughe LP, Malemba JJ, Divengi JP, *et al*. Itineraries of the rheumatic patients towards the rheumatologist in DR Congo. *Afr J Rheumatol* 2016;4:63–5.
24. Kiltz U, Baraliakos X, Karakostas P, *et al*. Do patients with non-radiographic axial spondylarthritis differ from patients with ankylosing spondylitis? *Arthritis Care Res* 2012;64:1415–22.
25. Malaviya AN, Kalyani A, Rawat R, *et al*. Comparison of patients with ankylosing spondylitis (AS) and non-radiographic axial spondyloarthritis (nr-axSpA) from a single rheumatology clinic in New Delhi. *Int J Rheum Dis* 2015;18:736–41.
26. Burgos-Varga R, Wei JC, Rahman MU, *et al*. The prevalence and clinical characteristics of non-radiographic axial spondyloarthritis among patients with inflammatory back pain in rheumatology practices: a multinational. *Multicenter* 2016;18:132.