



The management of gout in Africa: challenges and opportunities

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Abstract

The rise in non-communicable diseases in Africa presents challenges for health systems that are burdened by infectious diseases. Gout is one of those diseases that has seen an increase in numbers worldwide, including Africa. Gout is commonly associated with comorbidities and mortality. It directly impacts the quality of life, increases health costs, decreases physical function, and significantly increases the time from work, much of which is potentially avoided if treatment is instituted early. Despite advances in understanding the pathophysiology and outcomes of gout, the quality of care delivered to patients in Africa is still suboptimal. Existing data on gout in Africa reveals a general low index of suspicion due to limited knowledge of the disease by healthcare workers resulting in late diagnosis, with severe polyarticular tophaceous gout being a common presenting feature. These late presentations are associated with avoidable disability and increase the direct and indirect costs of managing gout. The challenges are related to lack of government budgetary support for staff training, infrastructure for diagnosis, and availing medicines. The picture of gout in Africa largely mirrors the west concerning risk factors, comorbidities, and burden of disease, but with some unique presentations seen in HIV, sickle cell disease, and vertigo. We discuss the challenges of gout diagnosis and management in Africa and propose a roadmap to improve gout outcomes across Africa.

Keywords AFLAR · Africa · Challenges · Gout · Opportunities

Background

Gout is the most common inflammatory arthritic condition characterized by urate crystal deposition into the joints [1]. It causes recurrent acute arthritis, subcutaneous tophi, and chronic painful arthritis and impacts morbidity and premature mortality [2]. It is commonly associated with cardiovascular and renal diseases and is an independent predictor of early death. Gout has a worldwide distribution. The different prevalence rates reflect the influences of environmental, dietary, and genetic factors [3]. For years gout was thought to be a preserve of the developed world. We are now seeing a surge in the numbers in

the developing world. The emergence of gout in Africa can be attributed to an increased awareness among healthcare givers of the disease and the adoption of more western lifestyles and diets by the developing world [4].

Epidemiology

The paucity of data on incidence and prevalence rates has led to underestimating the burden of gout in Africa. There is a shortage of up-to-date registries on the diagnosis and treatment of gout. This is regrettable, as gout patients have been shown to have an increased obesity rate, hypertension, type 2 diabetes, chronic kidney disease, dyslipidemia, cardiac disease, stroke, and peripheral arterial disease [1–4]. Thus, the gout diagnosis has financial implications both directly and indirectly, to the patients and their families. Direct costs include drugs, hospital visits, and physician fees for managing the disease and physical disability. The disease burden is more significant as it is associated with an increased number of comorbid conditions related to gout, such as hypertension, kidney disease, and diabetes. The indirect costs are associated with decreased productivity and lost wages due to work disability, absenteeism during gouty attacks, or even

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unemployment. It has been reported that patients with acute gouty arthritis attacks miss an average of 3 to 5 days of work annually [5]. Gout patients also suffer from disease-related quality of life impairment, which is difficult to estimate (intangible costs). Gout is associated with multiple comorbidities that lead to significant pain, disability, impaired quality of life, and societal values. Thus, early diagnosis and treatment can help decrease this burden and enable individuals to continue working and lead productive lives. In this review, we discuss the challenges of early diagnosis and treatment of gout in Africa and the opportunities to improve patient treatment outcomes on the continent.

Special challenges

As of 1 January 2020, the population of Africa was estimated to be 1,329,459,123 people, representing about 17.18% of the world's population [6]. The transformation that Africa has undergone in recent decades has been remarkable. We have made significant gains in governance, political stability, public health improvements, and overcoming social challenges like poverty and gender inequality. Hidden behind the transformation are narratives that have painted Africa as a continent faced with poverty, disease, political instability, forced migration, and corruption. These challenges have slowed down development in the continent. The rising non-communicable disorders pose a severe development challenge for low- and middle-income countries in Africa, which are already burdened by communicable diseases like HIV, malaria, and tuberculosis, among others. The healthcare system in Africa faces challenges related to human resources, leadership and governance, and health service delivery. A study done by Oleribe OO et al. reported that the leading problem affecting the healthcare sector in Africa is an inadequate human resource [7]. They noted that factors affecting healthcare personnel included sparse output from training institutions, brain drain to countries outside Africa, and poor attitude towards work in the public sector, among others [7]. The numbers of rheumatologists working across the continent are well below the recommended one per 100,000 people per World Health Organization (WHO) standards [8].

The distribution of rheumatology services in Africa is sparse and very skewed in delivery, with pockets of the continent having no rheumatological services whatsoever. A large number of rheumatologists are found in the North African countries, such as Algeria, Tunisia, Morocco, Egypt, and South Africa. The picture of gout in these areas also largely mirrors the West from numbers to risk factors. The challenges of managing gout in North Africa have some similarities to those South of Sahara though they have better healthcare infrastructure. Due to better healthcare services, compared with sub-Saharan Africa, they have improved outcomes as they

have better diagnostic access and a wider variety of urate-lowering therapy.

The number of rheumatologists in sub-Saharan Africa is estimated at 120, with the majority being in South Africa, which has about 80 adults and five pediatric rheumatologists serving a population of nearly 56 million people. Currently, there are only a few African rheumatology training programs. They are located in South Africa, Nigeria, and some North African countries, such as Egypt [9]. The African League Against Rheumatism (AFLAR) is currently planning a survey to ascertain the extent of rheumatology teaching, training, and services across the continent.

The low numbers of rheumatologists are due to the general shortage of doctors across Africa. Opportunities to train as rheumatologists are limited by lack of local rheumatology training programs and the unwillingness of provincial governments to train specialists in rheumatology. Many countries in sub-Saharan Africa already have models of care using nurses and community health workers. One survey done in 47 countries in sub-Saharan Africa showed that 25 of these countries were using non-physician clinicians in their healthcare system [9]. The low numbers of rheumatologists have led to scarce epidemiological data on gout, little awareness, and delayed referral of these patients, which has led to varied disease severity and management. Despite comprising 17.18% of the world's population, Africa still accounts for less than 1% of global research output [10]. The small numbers of rheumatologists have led to an absence or underrepresentation of rheumatology in the undergraduate medical curriculum in many medical schools around the continent.

Kumwenda did a survey looking into challenges facing young African scientists in their research careers [11]. The survey respondents cited a lack of mentorship, funds, and research and writing skills. The challenges highlighted by the survey included a lack of interest in research by policymakers, limited time for research due to heavy workload, and lack of motivation by peers [11]. The above has led to a lack of epidemiological data on rheumatic diseases, including gout, and their impact on African patients. A review by Usenbo et al. reported gout to be the 3rd most common arthritis in Africa after osteoarthritis and rheumatoid arthritis [12].

Diagnosis of gout

The human resource challenge has led to delays in diagnosis and poor service delivery for rheumatic and musculoskeletal diseases (RMDs) patients across the African continent, as access to rheumatologists is limited primarily due to numbers, and they are mainly located in urban areas where urban dwellers who can afford private care can access them [13]. Those living in rural areas need to incur additional costs of

travel to major centers for specialist care, consultation fees, laboratory, radiology, and treatment costs. Many African countries have small budgets for public health; hence, most of the laboratory, radiology, and treatment costs are out of pocket, which many patients cannot afford. One of the problems in many African countries concerning definitive diagnosis is that polarization microscopes are lacking, making diagnosis difficult. Even in top centers, these expensive microscopes are not seen, resulting in misdiagnosis and often very late diagnosis. Patients with tophi are still diagnosed as rheumatoid arthritis. The gold standard for gout diagnosis is confirmation of MSU crystals by polarizing light microscopy (PLM) of synovial fluid or tophaceous material. Most African countries have few to no polarized microscopes; Kenya, for example, has four lenses serving a population of about 40 million. There is also a shortage of personnel with expertise to do the joint aspiration and use the microscope. It has been shown that urate crystals can be stored at room temperature for a few weeks, making it possible to store samples for evaluation at a later stage [14]

Treatment

Treatment of gout has been hampered by the lack of local guidelines tailor-made for the African continent. Few countries have local guidelines, thus having to rely on the ACR/EULAR guidelines [15]. Most of the medicines are locally available, including colchicine and allopurinol. Febuxostat, however, is not available in countries like South Africa. The lack of guidelines means sub-optimal management from dosing the drug to the duration of treatment, especially at the primary care level. The high costs of these medications also have led to their reduced use. This has resulted in increased use of complementary treatments in rural areas, such as local healers and quacks, over-the-counter corticosteroids, and NSAIDs like phenylbutazone [16]. This may have detrimental effects on the patients. The use of traditional, complementary, and alternative medicines (TCAM) in the African continent is significant due to the high costs that limit the use of

conventional medicine. TCAM are popular as they are perceived to be cheaper and have few or no side effects [17]. They also align with sociocultural, religious, and spiritual values. Most patients fail to disclose the use of TCAMs partly due to healthcare providers' negative attitudes to TCAM and because healthcare providers did not inquire. Another direct impact of this is the rise of self-medication among the patients in developing countries [17]. Self-medication is immensely popular because these medications are accessible without prescription fees, cheap, and most useful in the acute arthritis of early gout. Steroid abuse is prevalent due to the fast onset of action and effectiveness in pain relief. Due to prolonged steroid exposure, it leads to hypertriglyceridemia and hypercholesterolemia and hyperglycosemia [17]. This also delays the use of urate-lowering agents early. These factors, together with various cultural factors, have led to delays in diagnosis and treatment gout in Africa [4]. One study by Mijinyawa M recorded that the time to diagnose gout was 8 years [18]. These findings may explain why most of the patients present with severe polyarticular gout at diagnosis, as shown in Table 1. The results differ from studies in the west where, at diagnosis, they had predominantly monoarticular disease. In their review, Genga et al. observed that patients often presented at diagnosis with tophaceous gout [4]. One survey by Lutalo SK et al. had all patients with polyarticular tophaceous gout disease [24]. A South African study by Mody GM et al. recorded that 3 in 4 patients presented with polyarthritis [19]. They also noted that about 1 in two of the gout patients had tophi. Similar findings have been noted in studies of Democratic Republic of Congo, Kenya, Nigeria, Senegal, South Africa, and Cameroon [20–23, 25, 26]. The measurement of serum uric acid is not readily available; thus, a potential reason why tophi are so frequent is that dosage adjustments are not being based on urate levels after starting therapy. This also hampers the use of treatment recommendations based on a treat-to-target (T2T) approach, aimed at lowering uric acid to low levels, by stepping up the dose of allopurinol based on the level of urate response [27].

Table 1 Presentation of patients at diagnosis in selected studies in Africa [adapted from [4]].

	Monoarticular	Oligoarticular	Polyarticular	Tophi
Mijinyawa M [18]	59%	43%	11%	19%
Mody et al. [19]	26%		74%	47%
Malemba et al. [20]	36%	38.9%		7%
Cassim et al. [21]	37.4%	28%	34.6%	
Tikly et al. [13]	55.6%		44.4%	51.1%
Oyoo et al. [22]	47.6%	19.1%	33.3%	19.1%
Adelowo et al. [23]	50%	35.6%	14.4%	6.2%

Comorbidities

An important observation has been that the extra-articular ramifications of hyperuricemia have been underestimated in Africa [4]. The suggested reasons include the fact that healthcare workers and patients in Africa may have underestimated the effect uric acid has outside the joints. They also noted a lack of data as they found only four published studies reporting on hyperuricemia from the continent [4]. These results are summarized in Table 2. A survey by Ranjith N et al. in South Africa pointed out that 26% of their myocardial infarct cohort had hyperuricemia [29]. Mapoure et al. noted in their study that one in two black patients with stroke had hyperuricemia [30]. Ghanaian research indicated that 46.3% of the stroke patients had hyperuricemia, which was associated with increased mortality [31]. A paper from Kenya by Adams et al. noted an association between hyperuricemia and vertigo, but the mechanism is unknown [32]. It is postulated that people with gout have a build-up of purine crystal deposits within the semicircular canals, thereby triggering vertigo. The uric acid is speculated to initiate an inflammatory response inducing the production of damaging reactive oxygen species that damage the vasculature, compromising blood supply to the inner ear [33]. It is still an area for further research due to limited data [33].

The surge in gout prevalence across the African continent can be partly attributed to an increase in the adoption of more western lifestyles by Africans [4, 12–26, 29–32]. Gout is associated with cardiovascular and renal diseases and is an independent predictor of premature death [2, 12–27, 29–32]. Gout is associated with increased rates of type 2 diabetes, obesity, hypertension, stroke kidney, and cardiac disease [34]. The picture of gout in Africa largely mirrors that of the west from risk factors to epidemiology [4, 12–26, 29–32]. As the number of cardio-metabolic diseases such as diabetes, hypertension, and kidney disease increased, there have been increased prescriptions of diuretics and statins across the African continent. There has been an association between drugs like

diuretics and hyperuricemia. Mody GM et al. noted that 42% of their patients with gout and hypertension were on diuretics [19].

The rise of cardio-metabolic diseases has led to a surge in hyperuricemia numbers, especially among women, when the clinicians are not too keen on the drug combinations. Gout is associated with diabetes, hypertension, and stroke, which have financial implications from investigations, the cost of drugs, and the cost of dealing with complications, such as dialysis. In a continent where infections are the leading cause of mortality and morbidity, the rise of non-communicable diseases has put an added strain on the already overburdened healthcare system. Most healthcare budgets prioritize the prevention and treatment of infectious diseases, whereas RMDs that are considered to have low epidemiology numbers and mortality are largely ignored.

There is a low index of suspicion in ladies due to later age of onset, with atypical presentation [35]. Studies have noted a later age of onset of gout in ladies [35]. Evert Jan Ter Borg recorded that majority of the female patients had age of onset after age of 60 years [35]. A review by KJM Jansen Dirken-Heukensfeldt et al. noted a later age of onset of diagnosis at 8.1 years as compared with men. The existence of comorbidities may overshadow gout diagnosis in ladies [36]. Women with gout more often had renal insufficiency and hypertension and were on diuretics. The contribution of alcohol is less in women as compared with men. Another reason for delay in diagnosis is the atypical presentation as they have lower prevalence of podagra at diagnosis and more other joints, like ankle, fingers, and upper limb [37]. Another potential reason for delay is that majority of the female patients do not have a high body mass index (BMI) which tends to lower the index of suspicion especially as the ladies get older [35, 38]. Tikly et al. found sex differences in the relation between obesity and gout in a study in South Africa.

Table 2 Comorbidities associated with gout in selected studies in Africa [adapted from [4]].

	Obesity	Hypertension	Diabetes	Dyslipidemia	Alcohol	Renal insufficiency
Tikly et al. [13]	✓	✓			✓	
Ndong et al. [25]	✓	✓	✓		✓	
Mijinyawa [18]	✓	✓			✓	
Bileckot et al. [28]	✓	✓	✓		✓	✓
Doualla-Bija M et al. [26]	✓	✓		✓	✓	✓
Adelowo et al. [23]	✓	✓	✓			✓
Oyoo et al. [22]	✓	✓	✓		✓	

They found no correlation between BMI and female gender, though a higher BMI > 25 was found *in men with gout* [13].

Unique presentations

There are some unique presentations of gout in the African continent associated with HIV disease. Before the introduction of HAART, the mortality rates from HIV were high, but with better care, patients live longer, and there is a rise in cardio-metabolic disease among HIV patients. Protease inhibitors are associated with hyperuricemia [39]. Other unique associations include vertigo and sickle cell anemia [28, 31].

Meeting the challenges

Despite the many challenges, the African continent has made great strides, and the future remains bright. Key strategies to improve gout outcomes include strengthening human resource capacity through public-private partnerships. We need more rheumatology training programs in Africa. We have a few scattered across the continent, for example, South Africa, West, and Northern Africa. There have been programs to empower the local physicians, such as the UWEZO initiative, a collaboration between Kenya, Sweden, and UK rheumatologists. They trained more than 500 healthcare workers, including physicians, doctors, clinical officers, nurses, and physiotherapists, to more than 11 sites across Kenya, imparting necessary skills [40]. The International League of Associations for Rheumatology (ILAR) has supported rheumatology post-graduate training programs in Kenya [41]. ILAR has funded the public rheumatology awareness programs and development of rheumatology services at the University Teaching Hospital in Lusaka, Zambia [42]. Apart from strengthening secondary care, there is a need to empower primary care doctors and community healthcare workers by including common rheumatic conditions in the undergraduate medical curriculum [41, 42]. In collaboration with local governments, teaching universities should also encourage staff interested in rheumatology to do fellowships. Local, regional organizations led by AFLAR should push for the adoption of local gout guidelines made specific for the African continent as this will also aid in faster time to diagnosis, treatment, and optimization of favorable outcomes.

As the rates of arthrocentesis are meager, one study reporting rates as low as 10%, the ACR/EULAR came up with a gout calculator to help make the gout diagnosis at the primary level of care [43–46]. This easy-to-use diagnostic rule for gout was specially developed for primary care and has shown to improve predictive value in making the diagnosis of gout, especially where joint aspiration is not available. The

most appropriate model contained the following predefined variables: male sex, previous patient-reported arthritis attack, onset within 1 day, joint redness, first metatarsophalangeal joint (MTP1) involvement, hypertension or one or more cardiovascular diseases, and serum uric acid level exceeding 5.88 mg/dL (to convert serum uric acid level to micromoles per liter, multiply by 59.485). The area under the receiver operating characteristic curve for this model was 0.85 (95% confidence interval, 0.81–0.90) [43]. With the increasing use of smartphones, tablets, and other electronic devices in Africa, local physicians can download the application and use it in remote areas as long as the internet is available. The lack of local guidelines hampers the diagnosis and management of gout across the African continent. The introduction of tailor-made guidelines for gout for the African continent will go a long way towards improving outcomes of patients afflicted by the disease, especially if they incorporate simple diagnostic tools.

Rheumatic diseases in Africa are not considered a priority, yet they have a significant impact on morbidity and mortality. This is partly attributed to the paucity of data on the epidemiology and burden of rheumatic diseases. Government policy should be directed towards research. There is an urgent need to strengthen the research capacity to address the unique challenges of rheumatology in Africa [11]. Research output from Africa has been low due to policymakers' low demand, lack of funding, lack of mentors, and researchers' motivation. The small scholarly production can also be attributed to the low numbers of journals, limiting the visibility of research done in Africa [47]. Research capacity can be improved by increasing government support, building research partnerships such as the African Journal Partnership Project, which has trained African researchers to improve the quality and visibility of their research [47, 48]. AFLAR has similarly been plagued by political and socioeconomic differences across the continent, sometimes compounded by language issues.

Consequently, the body has made slow strides since its separation from EULAR two or more decades ago, but its resources are increasing. For example, in 1984, South Africa had five rheumatologists, compared with 85 rheumatologists in 2020. The development of a strong social network and enthusiasm among the new executive members of AFLAR is likely to improve research, teaching, and service delivery for patients with rheumatic diseases across the continent [49]. Among its many plans for the future, it is hoped that AFLAR will be able to establish the bridge between different ministries within governments to combine financial, health, education, and social services under a single umbrella, as outlined in the mission of the bone and joint decade in 2001 [50]. Recently, Kenyan patients were successful

in getting the government to include connective tissue diseases among the group of conditions for special dispensations [51].

Global context

Africa accounted for 1% of the total health expenditures in 2015, despite making up 16% of the world population and contributing to 23% of the global disease burden [52]. The average amount allocated to the health sector by African Region countries stands at 9.8% of GDP, which is way short of the Abuja declaration urging the African Union States to award the health ministry “at least 15%” of national budgets [53]. The result is that up to 37% of Africa’s health spending comes from out-of-pocket payments [54]. This forces households to delay or forgo health care due to high costs. The steep health costs may explain the late presentation of gout patients across the continent. More effort should be put on increasing data collection, as this will drive policy change to raise funding. Data collection could potentially be achieved by including questions about joint pain and disability when collecting national census data. The increased funding will translate to more specialists, better pay for public healthcare workers to improve motivation and reduce brain drain. More rheumatology clinics in public hospitals with improved laboratory services and availability of drugs will bridge the gap of care between urban and rural areas. The 2010 World Health Report suggests that 20 to 40% of all healthcare resources are lost to inefficiencies in the system [52]. Thus, with improved budgetary support, a mechanism should be put in place to ensure that the available money is used appropriately.

Compliance

Adherence to medications is worse in gout than in many other diseases that have been documented [55]. The gaps in knowledge by patients and healthcare workers are essential for the poor adherence and outcome of these patients [55, 56]. Healthcare workers and patients sometimes concentrate on treating acute attacks and fail to institute urate-lowering therapy. There is evidence that when patients receive individualized education personalized to their needs, it significantly improves gout care in the long term [55, 56]. A commonly under-valued solution is nurse-led education programs. They should be encouraged as there is evidence that it yields successful outcomes [56].

Conclusions

There has been a rise in hyperuricemia and gout across the African continent. The picture of gout mirrors what is seen in western countries from western lifestyle adoption to increased amounts of obesity, hypertension, and diabetes. The burden of disease is probably underestimated based on the low index of suspicion, low scholarly output, a small number of rheumatologists, and limited government support for increasing human resources. Despite the challenges, the continent has made strides in rheumatology manpower and services, from setting up rheumatology fellowships to strengthening undergraduate training and international collaborations to bring improved rheumatology care the primary healthcare level. One potential solution is to develop clear gout guidelines that are tailor-made for Africa, and the use of the gout calculator should be encouraged. T2T strategies should be adopted and encouraged. Tailor-made gout guidelines for Africa through the AFLAR and regional bodies are crucial as some unique gout presentations arise from HIV, high TB burden, and sickle cell disease. A lot that needs to be done to ease the burden of gout ranges from earlier diagnosis to widespread availability and use of medicines. The roadmap to improve outcomes will require inputs from government, regional rheumatology associations, and donors. A critical area that will drive policy change is research, and the low scholarly output is disconcerting. The scarcity of data needs urgent attention, as this is hampering progress in raising awareness about the burden that gout carries across the African continent.

Compliance with ethical standards

Disclosures None

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