

Gouty arthritis in Nigerians: clinical and laboratory correlates

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Abstract

Background: Gout has been infrequently reported in black Africans despite the high prevalence in black Americans. There are even fewer reports in West Africans. However, there is a current trend towards increasing frequency among Caucasians, which is mostly due to increasing incidence of obesity, hypertension as well as the consumption of alcohol and other purine loaded foods and drinks. The increasing usage of diuretics and low dosage of aspirin may also be among the contributing factors. These factors are also increasingly been found in black Africans.

Objectives: To determine the correlation between the clinical presentations, laboratory findings and pattern of presentation of gout among Nigerians.

Design: A retrospective study.

Settings: The study was conducted at a private practice rheumatology clinic in Lagos, Nigeria. The clinic serves as a major referral rheumatology clinic for Lagos and the adjoining states.

Methods: The case notes of the patients seen over 10 years (January 2001- December 2010) were retrieved. The patients were those who met the American College of Rheumatology Criteria for gout. Data extracted included patients demography, pattern of joint involvement and co-morbid conditions. Necessary literature review was done.

Results: A total of 146 subjects were studied. Most of the patients were male (74%), the mean age for all subjects was 53.4 years. Large joints such as the knee and ankle were mostly involved. While monoarticular presentation was mostly observed in half of the subjects, oligo- and polyarticular presentations were seen in the remaining half. Tophi were observed in 6.2% of the subjects. Gout was predominantly associated with hypertension. Association was also found with obesity, diabetes, osteoarthritis and alcohol consumption to a lesser extent.

Conclusion: Gout seen in Nigerians has both similarities and differences compared to those seen in other black Africans.

Key words: Gouty arthritis, Nigerians, Associations, Clinical, Laboratory correlates

Introduction

Gout results from an abnormality of uric acid metabolism and/or secretion. It is usually characterised by hyperuricaemia which results from either overproduction of monosodium urate monohydrate or its undersecretion; or often a combination of both¹. Normal blood urate concentrations vary widely among different populations. Gouty arthritis results from the deposition of monosodium urate crystals in synovial joints, soft tissues as well as elsewhere².

Gout is predominantly seen in males, but also to a lesser extent among post menopausal women. It has been reported among various populations worldwide. In USA, the prevalence is higher among African Americans than Caucasians³. There have been few previous reports of gout among black Africans, and it has mostly been said to be uncommon⁴⁻⁸. Recent reports may however suggest an increased frequency, especially among West Africans^{9,10}. There is thus a need to determine the clinical presentation of this condition among this population.

The objective of this study was to elucidate the clinical presentations, associations and laboratory characteristics of Nigerian patients presenting with gout as well as compare the clinical features with those in other reported African studies.

Materials and Methods

This was a retrospective study of consecutive patients presenting with gout to a private practice rheumatology clinic, Arthrimed Specialist Clinic located in Lagos, Nigeria. These patients were seen over a ten year period, January 2001 to December 2010.

Patients presenting with the American College of Rheumatology

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(ACR) criteria for diagnosis of gout¹¹, especially the clinical and laboratory characteristics were included. These are (i) presence of arthritis developing within a period of twenty-four hours. (ii) previous episodes of monoarthritis. (iii) elevated serum uric acid greater than 7mg per 100ml using Calorimetric Coulter equipment. The sensitivity and specificity of the ACR criteria compared with the gold standard of synovial fluid crystal analysis have been shown to be of the order of 70% and 78.8% respectively¹². Patients were subjected to complete physical examinations, including Body Mass Index (BMI) – (calculation done by weight of patient in Kg divided by height in meter square) as determined by the World Health Organisation Expert Committee¹³. Blood was also taken for haematological, biochemical; as well as serology tests.

Results

A total of 2385 patients presenting with all musculo-skeletal complaints were seen in this clinic during the 10 year period. Out of this number, 146 were diagnosed as having gout, thus constituting 6.1% of the total number. The demographic characteristics of the diagnosed gout patients are as shown in Table 1.

Table 1: Demographic characteristics of 146 gout patients

Total number	146
Male	108 (74%)
Female	38 (26%)
Age at presentation (years)	
Range	38 – 90
Mean(all)	53.4 ± 11
Mean-Male	52.8±10.3
Mean-Female	54.9±13

Males were more commonly affected M:F= 2.8:1. Mean age at presentation for all subjects was 53.4±11 years with a higher mean age in women. Most of the patients had monoarthritis but there was a significant number of subjects presenting with oligoarthritis, and polyarthritis to a lesser extent as shown in Table 2.

Table 2: Pattern of joint affectations among 146 gout patients

Pattern of joint affectation	Frequency (%)
Monoarthritis	73 (50)
Oligoarthritis	52 (35.6)
Polyarthritis	21 (14.4)

A total of 225 joints were affected in 146 patients. The large joints were most commonly involved and to a lesser extent the first metatarsophalangeal joint as shown in Table 3.

Table 3: Joint affectation in 146 gouty arthritis subjects

Joint involvement	No. (%)
Knee	81 (55.5)
Ankle	50 (34.2)
Hallux	21 (14.4)
Other toes	15 (10.3)
Wrist	14 (9.6)
Metacarpophalangeal and proximal Interphalangeal	13 (8.9)
Shoulder	13 (8.9)
Elbow	12 (8.2)
Hip	6 (4.1)

Nine patients (6.2%) had tophi in various places but more over the joints of the elbow, hands and feet. Figures 1-5 show tophi on different locations with associated joint deformities.

Figure 1: Large tophi over the left knee in a patient with gout



Figure 2: Gross foot deformity and multiple tophi in a chronic gouty arthritis patient



Figure 3: Chronic tophaceous gout and arthritis of joints of the right forefoot in a patient who has had amputation of the left leg



Figure 4: Bilateral hand involvement with polyarthritis and deformities



Figure 5: Large tophi over the right elbow of a patient with gouty arthritis



Eighty eight patients (60.3%) had various co-morbidities with hypertension being the commonest. There were also associations with obesity, osteoarthritis and others as shown in Table 4. There was association with alcoholism in 26 (17.8%) of the subjects. Eighteen subjects (12.7%) were obese with 4 having class 1 obesity (BMI = 30 – 34.9 kg/m²); 6 subjects had class 2 obesity (BMI 35 – 39.9 kg/m²) while 8 subjects had class 3 obesity (BMI > 40kg/m²)

Table 4: Co-morbidities and associations of gout among Nigerian patients

Risk factor/co-morbidities	Frequency (%)
Hypertension	72 (49.3)
Obesity	18 (12.3)
Osteoarthritis	15 (10.3)
Diabetes mellitus	6 (4.1)
Lymphoproliferative disease	1 (0.7)
Renal failure	1 (0.7)
Post renal transplant	1 (0.7)
Psoriatic arthritis	1 (0.7)
Sickle cell disease	1 (0.7)
Tuberculosis of the spine on	1 (0.7)
Pyrazinamide rheumatoid arthritis	1 (0.7)

Table 5: Comparative characteristics of gout among various African populations

	Togo Mijinyawa ⁹	South Africa 1 Cassim <i>et al</i> ¹⁹	South Africa 2 Mody <i>et al</i> ¹⁸	South Africa 3 Tikly <i>et al</i> ²¹	Kenya Oyoo ²⁰	Nigeria Adelowo <i>et al.</i> (Present study)
Number of subjects	106	107	19	90	21	146
Male: Female	16.1:1	6.1:1	3.8:1	3.3:1	9.5:1	2.8:1
Mean age (all)	45.0				47.5	
Male			50.0	54.3		52.8
Female			52.0	55.3		54.9
Duration of symptom (mean years)	8.0		3.1			3.6
No. of joints involved (%)						
Monoarthritis	59.0	37.4	26.0	55.6	47.6	50.5
Oligoarthritis		28.0			19.1	31.8
Polyarthritis	41.0	34.6	74.0	44.4	33.3	14.3
Tophi (%)	19.0		47.0	51.1	19.1	6.2
Joints affected (%)						
Knee		85.0	79.0		14.1	55.5
MTP		74.8	58.0		34.9	14.4
Ankle/Feet		61.7	42.0		18.6	34.4
Shoulder					4.6	1.4
MCP/PIP			32.0		9.3	8.9
Elbow			26.0			
Soft tissue			3.0			3.4
Co-morbidities/ Associations(%)						
Hypertension	39.0		42.0		61.5	49.3
Obesity	38.0				90.5	12.7
Diabetes			10.5		7.7	4.1
Alcohol	74.0				100	17.8
Osteoarthritis					15.4	10.3

Laboratory results: One hundred and sixteen (79.5%) had elevated uric acid above 7mg/dl at presentation. The remaining that were normouricaemic however eventually developed elevated plasma uric acid on follow-up. Range of uric acid at presentation was 2.5-14.3mg/dl with a mean of 7.9 ± 2.4 mg/dl. Haematocrit at presentation was in the range of 24 – 52% with a mean of 37.6 ± 5.6 . Erythrocyte Sedimentation Rate (ESR) was available in 114 patients. The values ranged between 2 – 140 mm/hr with a mean of 45.4 ± 37.6 mm/hr. Forty eight subjects (32.9%) had ESR above the normal limit of 20mm/hr. Plasma total cholesterol was available in 64 patients. Out of this, 38 (59.3%) had levels above 192mg/dl. The range was 125-402mg/dl with a mean of 211 ± 56.8 mg/dl. Thirty five subjects had results of plasma triglycerides available, of which only 4 (11.4%) had levels above 150mg/dl. The range of plasma triglycerides was 57-349mg/dl (mean 129.5 ± 60.3). Rheumatoid factor by latex agglutination method was available in 37 patients and all were negative.

Treatment: Treatment was with standard drugs of non steroidal anti inflammatory drugs with or without colchicine. Intra articular corticosteroids was also

administered in those with knee involvement. Patients with recurrent attacks and elevated serum uric acid above 11mg/dl were given the xanthine oxidase inhibitor, allopurinol. Oral corticosteroid was not given as most patients refused or were unsuitable because of co existing co morbidities such as diabetes.

Discussion

There are increasing reports of gout in various populations worldwide, particularly in the elderly persons¹⁴. For instance, studies from USA have showed an increased prevalence of gout from 2.9/1000 persons in 1990 to 5.2 per 1000 persons in 1999¹⁵. A more recent study from USA has also shown that the number of self reported cases increased from 2.1 million to 3 million over a ten year period^{16,17}. Most of the reports from black Africa in the 60's and 70's have been single case reports. However from the 80's there have been moderate numbers case series reports¹⁸⁻²¹.

Such increase in reportage is probably exemplified among Nigerians. For instance only two patients (1.4%) with gout were reported out of a total of 138

rheumatology cases seen in 1982 at a university teaching hospital⁶. This present study found 146 subjects (6.1%) with gout out of the total of 2385 subjects presenting to the clinic in the study period. The seeming increased reports of gout in Nigerians and other black Africans or elsewhere could be attributed to various reasons such as adoption of western lifestyle and diets rich in cholesterol and purines. Other reasons could be the increased alcohol consumption, hypertension, increased usage of low dose aspirin, renal failure and obesity.

As shown in Table 5 there are both similarities and dissimilarities in the demographics and associations of gout among different black African populations. The recognized male preponderance of gout is confirmed in our study, though the male to female ratios vary widely. While our study gave a ratio of 2.8:1 similar to South African reports of 3.3:1 and 3.8:1, however reports from Kenya and Togo gave gender ratios of 9.5:1 and 16.1:1 respectively^{9,20}. This wide variation is difficult to explain and may be due to patient selection. The mean age at presentation in our study was 53.4 years (male – 52.8 ±10.3; female – 54.9 ±13.9). This is in consonance with the findings among other black African populations as shown in Table 5. There is, as expected, a higher mean age in females because of occurrence of gout in post menopausal women. The mean duration of symptoms before presentation in our study was 3.6 years, similar to reports in black South Africans with a mean of 3.1 years¹⁸. This however contrasts to a mean of 8 years among Togolese patients. It is generally known that there is delayed hospital attendance for most diseases among black Africans. This may be due to poor utilization of health facilities, or non-affordability of hospital costs. It may also be due to the competing consultation by patients of traditional healers and other alternative practitioners.

Studies among Caucasians have always shown a dominant mono-articular gout presentation. Some reports in African blacks have shown the contrary. Half of our subjects had monoarticular presentation (50.5%) but with significant oligoarticular (31.8%) and polyarticular (14.3%) presentations. Studies from other African countries have also shown dominant polyarticular or oligoarticular presentation (Table 5). Large joints such as the knee, ankle are predominantly involved in our study with relatively less metatarsophalangeal joint involvement. This is in contrast to the predominant metatarsophalangeal joint involvement among Caucasians. Studies from South Africa have also shown predominant large joints involvements too^{18,19}. Soft tissue involvement of bursitis were seen in 3.4% of our patients similar to the 3% reported by Mody and Naidoo¹⁸. Tophi were seen in only 6.2% of our patients and they were mostly over the elbow joints. Some of the tophi were, however, large and deforming (Figures 1-4). Our study showed a lower frequency of tophi than reported from elsewhere in Africa.

The associations and co-morbidities of gout are as reported elsewhere, with hypertension occurring significantly (Table 5). There have been reports of high

association of gout and hypertension in black African Americans³. Other associations include obesity (12.3%); osteoarthritis (10.3%); dyslipidaemia (10.3%). These associations have also been reported variously from other African studies^{9,18,20}. A significant departure from other reports however is the rather low frequency of association with alcohol. In our patients, 4.1%; in contrast to 74% in Togo⁹ and 100% in Kenya²⁰ as well as South Africa¹⁸. This may be attributable to differences in religious and social influences. Of particular note is the association of gout with osteoarthritis in our study. It has been suggested that the tissue changes in osteoarthritis may encourage local deposition of monosodium urate crystals in the joints involved, hence such association²². As seen in Table 4, other associations of gout in our study includes lymphoproliferative disease, renal failure, post renal transplant, and psoriatic arthritis. Co existing gout and rheumatoid arthritis was seen in one of our patients. There has been a previous report of this association in a Nigerian⁸. However such coexisting rheumatoid arthritis and gout have been reported as being rare²³.

Most of our subjects (79.5%) had elevated uric acid level at presentation, although others had elevation during subsequent visits. It is well recognised that elevated uric acid may not be a reflection of an acute attack and may in fact be normal. This has been attributed to the triggering of the acute phase response and an accompanying urinary urate excretion^{24,25}.

Our study population may not be representative of the community, especially being a specialty based practice. The location of the practice is urban and cosmopolitan and thus do not reflect the reality in the rural population. However, in view of the dearth of community based studies, our report indicates the possible rising frequency of gout among Nigerians. It would have been ideal to predicate our diagnosis on the demonstration of the crystals with polarized light microscopy. This is not however available. Diagnosis was made on clinical grounds as well as determination of serum uric acid, often times done repeatedly. In any case, the ACR criteria for diagnosis of gout which is mostly clinical has been shown to have a sensitivity of 70% and a specificity of 78.8%¹². According to Dalbeth *et al*²⁶, "The definitive classification or diagnosis of gout normally relies upon the identification of MSU crystals in synovial fluid or tophi. Where microscopic examination of synovial fluid is not available or is impractical the best approach may differ depending upon the context. For many types of research, clinical classification criteria are necessary". It is hoped that more extensive community based studies will further elucidate the pattern of gout among Nigerians.

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