

Prevalence and Patterns of Male Androgenetic Alopecia in Tarauni, Kano, Nigeria

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ABSTRACT

Background: Male androgenetic alopecia (MAA) is disorder which may significantly impact on the individual's self-image and lead to decreased quality of life (QoL). Its prevalence and pattern vary in different races and ages. It has been associated with cardiovascular risk factors. Information about its prevalence and pattern is lacking in this environment. This study aims to describe the prevalence and pattern of AGA in Tarauni local government area, Kano state.

Methods: It is a cross sectional, descriptive, community based study. Four hundred males aged 18 years and above were selected through a multistage sampling process. Study subjects were subjected to physical examination and relevant history was taken. Grading of AGA was done using Norwood-Hamilton classification. The data was analysed using the Statistical Packages for Social Sciences V16.

Results: The overall prevalence of MAA (Grade I-VII Norwood-Hamilton) in the 400 subjects was 65% with group prevalence of 50.4% in participants aged 18-29 years, 54.4% in those aged 30-39 years, 72.2% in those aged 40-49 years, 76.1% in those aged 50-59 years, 90.6% in those aged 60-69 years and 100 in those aged 70 years and above. MAA has a self-reported onset at about 20-24 years with a range of 17-30 years. The prevalence of cosmetically obvious (severe) forms (III-VII) was 20.3%. Frontal balding patterns were commoner than vertex balding (80.3% vs 19.7%). Mild degrees of balding (Norwood I-II) were the commonest across the age groups. Atypical patterns have a prevalence of 0.3%. The prevalence of hypertension was 28.5% among men with MAA compared to men without MAA, 17.1%. (28.5% vs 17.1% $p=0.021$), however MAA was not an independent predictor of hypertensive status.

Conclusion: The prevalence of AGA is much lower than that of Caucasians and much closer to that of Asians. Frontal balding and mild degrees of balding are the commonest patterns across all age groups. Hypertension is more frequent among those with AGA than controls, but AGA is not an independent predictor of hypertensive status.

BACKGROUND

Androgenetic alopecia (AGA) also known as male pattern baldness, male pattern hairloss, is a common cause of hair loss in men and women globally. It is a slow hair loss process in a patterned distribution and can occur at any time after puberty. Male androgenetic alopecia (MAA) begins with bitemporal recession of the frontal hairline followed by diffuse thinning over the vertex of the scalp. The bald patch progressively enlarges and ultimately leads to complete baldness except at the lateral and occipital margins of the scalp. Variations in the pattern of the baldness depends on the difference in hair loss rate in various scalp

areas. The aetiology and pathogenesis of AGA is not fully understood, however it is most likely multifactorial with an interplay between genetic factors, androgens and age.² The inheritance pattern of androgenetic alopecia is unclear but genetic and environmental factors are likely to be involved. Having a close relative with patterned hair loss appears to be a risk factor for developing the condition. Conversion of testosterone into dihydrotestosterone (DHT) in the hair follicles catalysed by the enzyme 5 α dihydrofolate reductase, and binding of DHT to androgenic receptors in the hair follicle, triggers cellular processes that reduces the anagen phase of hair cycle. For this reason, the hair passes earlier into

telogen phase and falls out.³The role of testosterone appears to be independent of the genetic predisposition. Hamilton was the first to grade the severity of AGA from class I to VII. This was later modified by Norwood with the addition of class IIIa, III vertex, IVA and VA. This modified grading is universally accepted as Norwood-Hamilton classification.¹ Androgenetic alopecia affects approximately 40% of men and women. In men, the age of onset is usually between 20-25 years and the prevalence and severity increase with age.

In general 30% of Caucasians are affected by age 30, 50% by age 50 and 80% by age 70 years. The global incidence varies among ethnic groups with the greatest incidence found among Caucasians followed by Asians, African Americans and Native Americans.⁸⁻¹⁰ Studies in the US has shown it to be four times less common in men of African American origin compared with whites.¹ There are no community studies on prevalence of AGA in Nigeria, men with AGA hardly report to the hospital. AGA is traditionally considered a cosmetic disorder, unfortunately it may be associated with loss of self-esteem, depression, introvertism especially if it starts early.¹⁶⁻²⁰

Studies have reported an association between AGA and the metabolic syndrome (Mets). Other associated diseases include coronary artery disease, polycystic ovarian syndrome, Cushing's disease, nutritional deficiencies and recently COVID-19. This has led to the suggestion that patients with AGA should be screened for Mets and cardiovascular risk factors making AGA a possible cutaneous marker for these conditions. With the paucity of information on AGA in our environment, we decided to determine the prevalence and pattern of this disorder in our local population.

MATERIALS AND METHODS

This study was a cross-sectional, descriptive, community-based study which was carried out across 5 electoral wards in Tarauni local Government in Kano State, Northern Nigeria. Multi stage sampling method was used to select the participants.

Five electoral wards from the ten electoral wards in

the Local Government were randomly selected using simple random sampling (balloting) technique. In the second stage, half of the Settlements in each of the five selected wards were randomly sampled. In the third stage the number of the households to be studied in each of the selected settlement was allocated proportionate to the population of the settlement. Finally, respondent were selected from the households through systematic sampling. In each settlement after household listing, the first household to be studied were selected using simple random sampling the subsequent houses were selected by adding the sampling interval to the first selected house. This was continued until the sample size allocated to each settlement was obtained.

Four hundred males (400) aged 18 years and above were selected through the above sampling process. Study subjects were interviewed with a questionnaire and weight, height, and blood pressures were measured. Data was collected via an interviewer administered questionnaire. Grading of MAA was done by the dermatologist and other trained doctors using Hamilton-Norwood classification. Ethical approval was obtained from the Aminu Kano Teaching Hospital ethical committee. The data was analysed using the Statistical Packages for Social Sciences, SPSS v16.

RESULTS

A total of 400 men were recruited in the study. Participant's ages ranged from 18-86 years with an overall mean and SD $39.6 \pm (14.3)$ (*Figure 1*)

Two hundred and sixty subjects had at least grade I MAA giving an overall prevalence of 65%. There was an age related increase in prevalence from 50.4% in the age group 18-29, 54.4% in the age group 30-39 years, 76.1% in the age group 50-59 years to 100% in the age group ≥ 70 %. (*Table 2*)

The overall prevalence of androgenetic alopecia (grade I-VII) was 65% while the prevalence of severe forms (III-VII) was 20.3%. The prevalence increased with age (*Figure 2*). Frontal balding patterns are commoner than vertex balding (80.3% vs 19.7%). One subject had an atypical pattern (0.4%).

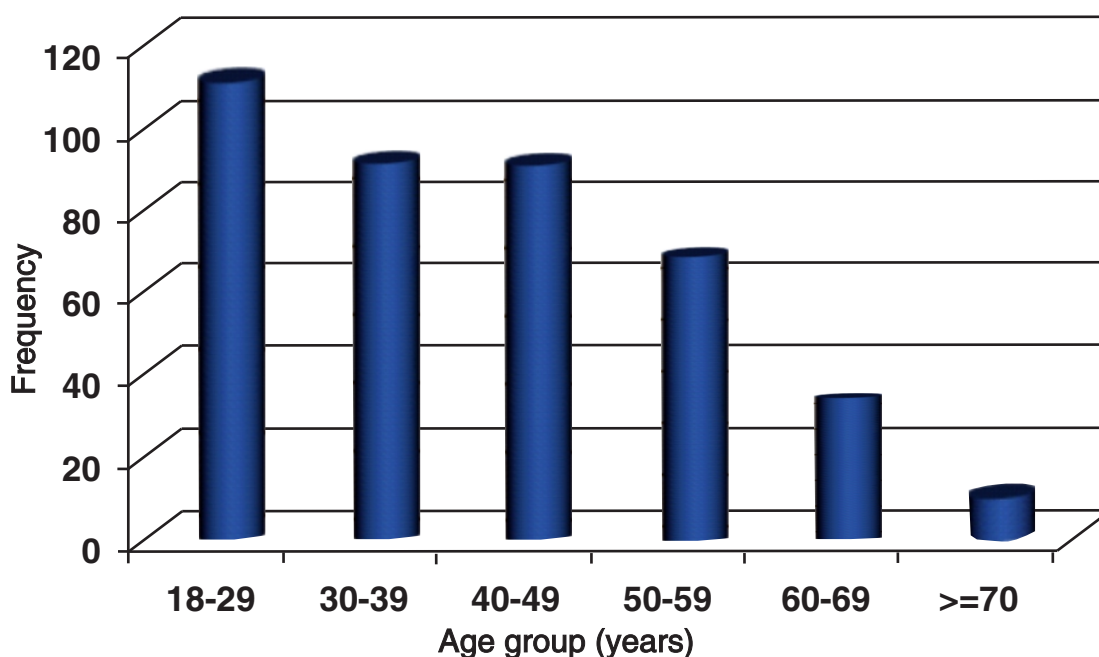


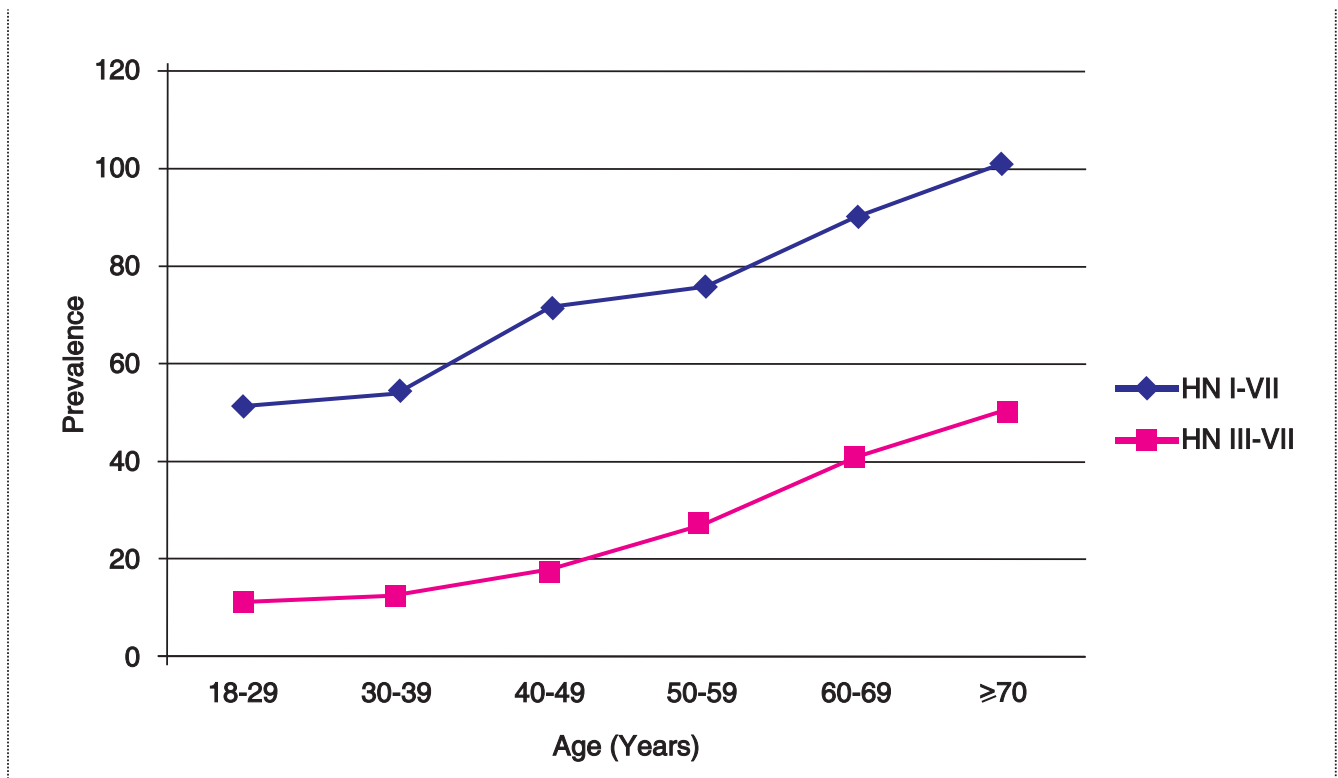
Figure 1: Age Range of Participants

Figure one shows the age distribution of the participants. Participant's ages ranged from 18-86 years with an overall mean and SD $39.6 \pm(14.3)$

Grade	AGE (Years)						Total (400)
	18 – 29 (n=111) (%)	30 – 39 (n=90)	40 – 49 (n=90)	50–59 (n=67)	60 – 69 (n=32)	≥ 70 (n=10)	
I	25 (22.5)	28 (31.1)	17 (18.9)	9 (13.4)	3 (9.4)	0 (0)	82 (20.5)
II	19 (17.1)	10 (11.1)	26 (28.8)	24 (35.8)	13 (40.6)	5 (50)	97 (24.2)
III	10 (9.0)	5 (5.6)	9 (10.0)	7 (10.4)	7 (21.9)	1 (10)	39 (9.7)
IV	1 (0.9)	4 (4.4)	7 (7.8)	3 (4.5)	2 (6.2)	1 (10)	18 (4.5)
V	1 (0.9)	0 (0)	3 (3.3)	3 (4.5)	0 (0.0)	1 (10)	8 (2.0)
VI	0 (0)	1 (1.1)	2 (2.2)	4 (6.0)	1 (3.1)	1 (10)	6 (1.5)
VII	0 (0)	1 (1.1)	1 (1.1)	1 (1.5)	2 (6.2)	1 (10)	6 (1.5)
Variants	0 (0)	0 (0)	0 (0)	0 (0)	1 (3.1)	0 (0)	1 (0.3)
TOTAL	56 (50.4)	49 (54.4)	65 (72.2)	51 (76.1)	29 (90.6)	10 (100)	260 (65)

Table 1: Prevalence of Androgenetic Alopecia

Figure 2: Shows the prevalence of Severe and mild form of Androgenetic alopecia based on the Hamilton-Norwood staging.



Key-HN- Hamilton-Norwood.

The prevalence of androgenetic alopecia (grade I-VII) is 65%. The prevalence of severe forms (III-VII) is 20.3%. The prevalence of AGA increased with age.

Table 2: Shows the distribution of patterns of androgenetic alopecia among the study population.

Pattern	No (%)
Frontal	I 82 (31.5)
	II 97 (37.3)
	III 30 (11.5)
Vertex	IIIv 9 (3.5)
	IV 18 (6.9)
	V 8 (3.1)
	VI 9 (3.5)
VII 6 (2.3)	
Variants/ Atypical	1 (0.4)
	260 (100)

DISCUSSION

The paucity of data on the prevalence and pattern AGA in Nigeria may have been due to its initial perception as a cosmetic problem with no associated morbidity. With the increase awareness of treatment modalities for AGA such as minoxidil and hair transplantation more individuals are seen in the clinic especially as it has a negative impact on the quality of life of young individuals.

Onset of MAA was reported as occurring at the age of 15 to 19 years in about a quarter of the recipients. This is in keeping with the findings of Norwood³ and Seghal,⁷¹ However others have reported onset of MAA with onset of puberty.^{74, 75} Recent studies have shown that AGA can begin as early as 6 years of age⁷⁶ and up to 14.1-15.5% of US population of male adolescent aged 15-17 years have early evidence of AGA.⁷⁵⁻⁷⁷ In this study no respondent reported onset below 17 years. However, the results of this study may be affected by recall bias and lack of appreciation of mild forms of AGA. About a third of the respondents reported an onset between 20-24 years of age.

Its recent association with the Mets and cardiovascular disorders suggest AGA may serve as a cutaneous marker for these disorders. MAA has racial as well as age related prevalence's and pattern .

MAA has been divided into mild (grade I &II) and cosmetically significant (grade III-VII) also known as the severe forms. Overall prevalence of AGA in men (grade I–VII) in this study was 65% similar to what was reported among by Tang et al in Singapore where they found a prevalence of 63%.² In studies that considered severe forms only our prevalence of 20% was lower than what was reported in Finland (46%)³, and Australia (44.9%)⁴, but similar to what was reported in China, (21.3%)⁵, but higher than in Koreans while (14.1%)⁶.

Khumalo *et al* found a prevalence of 14.6% in South Africa⁷, while a prevalence of 7.5% was reported in the outpatient dermatology clinic in Burkina faso⁸ while both figures are lower that our figures, details of the classification of severity were not stated. The prevalence reported in Burkina faso

probably represents an underestimation because of the hospital based nature of the study. It would appear that the prevalence of severe forms of AGA is highest in Caucasians, followed by Asians then Africans, however further well standardized studies are needed to clarify prevalence across Africa. The increasing in prevalence of MAA with age is consistent with what is known about AGA generally .

This study found most men (68.8%) with AGA had frontal patterns of AGA (Type I&II) which was similar to reports from Singapore and India by Tang et al² and Seghal et al⁹ respectively. Some workers in practice consider these mild patterns (I&II) to be so common that they can be considered as “normal.”³ In contrasts type IIIv is the most common type in Koreans and Chinese.^{6,10}

The peak of severe AGA in this study was the 8th decade when about 50% of men were affected. This is in contrast to one study¹¹ which shows half of all Caucasians already suffer from severe AGA by the 5th decade suggesting a less extensive balding pattern in this study compared to Caucasians.

Frontal balding patterns are commoner than vertex balding (80.7% vs 19.3%). This is similar to findings in Caucasians and Indians.^{9, 12, 13} This is contrast to findings in Chinese (mixed)⁵ and Koreans (vertex)⁶

In conclusion Androgenetic alopecia (I-VII) in the study population has a prevalence of 65%. The prevalence of severe forms AGA (III-VII) is 20.3%. This is lower than that of Caucasians. Our Study subjects suffer from less extensive balding patterns than Caucasians of the same age. Variants of the Norwood-Hamilton pattern occur in the study population but the prevalence is low (0.3%).

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