Cardiovascular Risk Factors: a Silent Epidemic among Urban Adult Male Socialites.

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Abstract

Background: *Cardiovascular disease is a major contributor to mortality worldwide and a significant determinant of life expectancy which is estimated at 59 years in Nigerian males and 63 years in females. It is therefore necessary to identify cardiovascular risk factors among various adult populations. Effective surveillance of cardiovascular risk factors is advocated to reduce the associated morbidities and mortalities. This study therefore set out to determine the prevalence and pattern of cardiovascular risk factors among adult male members of an elite social club in an urban metropolitan city.*

Methods: *An opportunistic cross-sectional study that recruited 97 adult male members of an elite social club in Lagos, Nigeria during the 2019 International Society of Hypertension May Measurement month. Their demographic and anthropometric parameters were obtained. Blood pressures were measured and blood samples were taken for fasting blood sugar and fasting lipid profile while urine samples were taken for micro-albuminuria assay. Data was analyzed using SPSS version 20.0 software.*

Results: *The mean age of the study population was 56.6 $\pm$ 12.6 years (range 35-83 years). The overall prevalence of hypertension was 61.7%. Half of the hypertensive population was previously diagnosed hypertensive. Obesity and dyslipidemia were seen in 65.0% and 80.0% respectively while the prevalence of abnormal blood sugar and micro-albuminuria was 16.0% and 15.0% respectively.*

Conclusion: *Cardiovascular risk factors are common among affluent male socialites. Targeted screening, health education, aggressive treatment and lifestyle changes will go a long way in reducing the burden of these cardiovascular disease risk factors.*

Keywords: cardiovascular risk factors; male; hypertension; obesity; dyslipidemia.

Introduction

Cardiovascular Disease (CVD) is a major contributor to morbidity and mortality worldwide and a significant determinant of life expectancy.1, 2 The frequently encountered CVDs like high blood pressure, heart failure, cerebrovascular disease, kidney failure, hypertensive emergencies and peripheral vascular disease are responsible for the rising frequency of morbidities and mortalities.2-4 In Africa, the prevalence of CVD is on a rapid rise and has been described as an epidemic.2, 4 As expected, the cardiovascular risk factors associated with these CVDs, both modifiable and non-modifiable, are also on ascendancy. The modifiable risk factors for CVD (such as smoking, obesity, low physical activity, high blood cholesterol and lipid levels), which would have been presumed to be on the decline, owing to increased awareness and sensitization, have however been reported to be on the increase.1, 5-7 Many factors like westernization of diet, sedentary lifestyle and increasing affluence have been postulated as some of the drivers of the increase in cardiovascular risk factors.1, 2 Increased affluence worsens the risk of CVDs through westernization of diet as well as high calory and unsaturated fat intake.1, 8, 9

Similarly, Prevalence of Diabetes Mellitus (DM), impaired fasting blood sugar and micro-albuminuria have been reported to be high among urban dwellers and also in western world.2, 3 In fact urban dwelling, physical inactivity, advancing age and unhealthy diet have been reported as risk factors for DM and CVDs.2, 3 While socioeconomic status of individuals may make them prone to CVD at both ends of the social stratum in low and middle income countries of the world,10 some studies however showed no evidence of association between social status and the risks of cardiovascular diseases.11

Prior to now, the low life expectancy in Africa was attributed to poverty, poor feeding, scourge of infectious diseases, poly-microbial antibiotic resistance, multidrug-resistant tuberculosis and HIV/AIDS as well as the inability of the healthcare structure to cater for the growing health challenges.1 The emerging trend of increase in CVD in Africa may overwhelm the existing healthcare structure.1 For instance, in Nigeria, the relatively low life expectancy in the country may be significantly driven by CVD beyond the commonly blamed infectious and other poverty-related diseases.[1,12] In developed countries, there was an increase in the mortality associated with ischemic heart disease by 29% and 48% in females and males respectively between 1990 and 2020, with hypertension being responsible for most of the deaths.2,13 Prevalence of hypertension in Africa is approximately 46% with males having higher blood pressures than females.14

As economic indices improve in Nigeria, it is projected that there will be a shift in the infective and poverty related diseases to affluence related ones such as CVDs.1 Therefore, there is a need to educate the populace on the risks of CVDs and their preventive measures. There seems to be low awareness about CVD and its risks among various populations.5, 7, 15-18 From the foregoing, health education, screening, identification of cardiovascular risk factors and targeted preventive strategies among various vulnerable populations like the affluent and socialites, will therefore go a long way at reduction of CVDs.19 One of the various targeted screening programs is the May Measurement Month (MMM) which is a global initiative of the International Society of Hypertension (ISH) aimed at raising awareness of high blood pressure

(BP) as well as other cardiovascular risk factors to mitigate the lack of screening programs especially in developing countries.20 This is projected to identify these risk factors early and help reduce the burden of CVD and thus improve life expectancy especially in Africa.18 In the same vein, the World Heart Federation started the commemoration of World Heart Day in 2000 to increase the awareness of cardiovascular risk factors, encourage targeted screening and promote early disease identification in order to reduce the burden of cardiovascular diseases.18, 21 Therefore, a way of targeting the elites and affluent is to domicile the above screening program in their hangouts like social clubs and recreational centers even though most of these social clubs are male dominated.

Few studies done on socioeconomic status and cardiovascular risk factors suggested a linear relationship between income and CVD risk.7-9 However, none have targeted the elite male population. This study which was carried out among a male dominated elite club in the urban metropolitan city of Lagos as part of the 2019 May Measurement Month, therefore set out to determine the prevalence and pattern of cardiovascular risk factors among these seemingly at-risk population. This will help in the development of policies and guidelines in addressing CVD risk factors among this population.

Methodology

Study design and study population

This was a descriptive cross-sectional study conducted at a foremost social club in the urban metropolitan city of Lagos, Nigeria as part of the targeted screening programs of the 2019 May Measurement Month (MMM), an initiative of the International Society of Hypertension. This study consecutively recruited all members of the male dominated social club during the screening program. Lagos is a metropolitan city with about 25 million people. All members of the club were eligible while members with acute illnesses were excluded.

Sample size determination and data collection

The minimum sample size of 90 for this study was calculated using the formula for finite population size. A standard normal deviate of 1.96 which corresponds to 95% confidence level and a precision of 5% were used. We also used a prevalence of hypertension of 69% obtained from a previous study of cardiovascular risk factors.22 A total of 97 consecutive members of the club were recruited. Social stratification was done and an elite/ high income earner was defined as monthly income earnings ≥ $645 (#270,900 @ #420=$1).5, 23 The following information was obtained; age, marital status, highest level of education, previous history of hypertension or diabetes, known family history of hypertension or diabetes or of sudden death, long-term medications, history of alcohol or cigarette intake and daily physical activities. Clinical parameters measured included weight (using OMRON digital weighing scale with 99% accuracy), height (Stadiometer) and waist circumference (using flexible meter tape rule) at the mid portion between anterior superior iliac spine and lowermost rib during mid-expiration.

The blood pressure was taken from the left arm with the subject having rested for at least 5 minutes according to standard BP measurement protocol using ROSSMAX X9 digital blood pressure monitor equipped with pulse arrhythmia technology. A total of three blood pressure readings were taken and averaged. This was used to classify the subject into normal blood pressure, prehypertension and hypertension according to the Joint National Committee on Prevention, Detection, Evaluation and Treatment of

High Blood Pressure (JNC VII) criteria.24 Blood sugar was estimated using Accu-check active glucometer which has 100% accuracy for blood glucose levels of 10-597mg/dl, Total cholesterol was measured using Lipid pro kit manufactured in South Africa with a high sensitivity for cholesterol levels in non-anemic patients while micro-albuminuria assay was done using an immunochemical semi-quantitative kit (Micral Test™ strip) manufactured by Roche diagnostics, USA, 2010. Microalbuminuria was defined as 20-200mg/L albumin in urine. Detection levels at ≥20mg/L were termed positive.

Hypertension was defined as average blood pressure ≥ 140/90 mmHg or someone on antihypertensive therapies according to the JNC criteria.24 Body mass index (BMI) was determined using the standard technique of dividing weigh in kilogram by the square of height in meters. Overweight was defined as BMI 25-29.9 kg/m2 while obesity was defined as BMI ≥ 30 kg/M^2. Visceral obesity was defined as waist circumference > 102 cm in males. Hypercholesterolemia was defined as TC > 200 mg/dl. Diabetes was defined as fasting blood sugar > 126 mg/dl while impaired blood glucose was defined as fasting blood sugar between 110 -120 mg/dl. Physical activity ≥ three times per week of 30 minutes per occasion, were classified as physically active. The use of tobacco was categorized as non-smokers and ever smoked 25 while alcohol ingestion of more than 2 units per day was classified as significant alcohol use.26

Data analysis and ethics

Statistical analysis was done using the Statistical Package for Social Sciences (SPSS) version 20.0 (Chicago IL. USA). Quantitative data (Blood pressure, total cholesterol, weight, height, Body Mass Index, fasting blood glucose, waist circumference) were summarized as means ± standard deviation, while qualitative data (prevalence and patterns of risk factors) were summarized in frequencies and percentages. Distribution by the number of risk factors was expressed as bar chart. Ethical approval was sought and obtained from the Lagos State University Teaching Hospital ethics and research committee.

Results

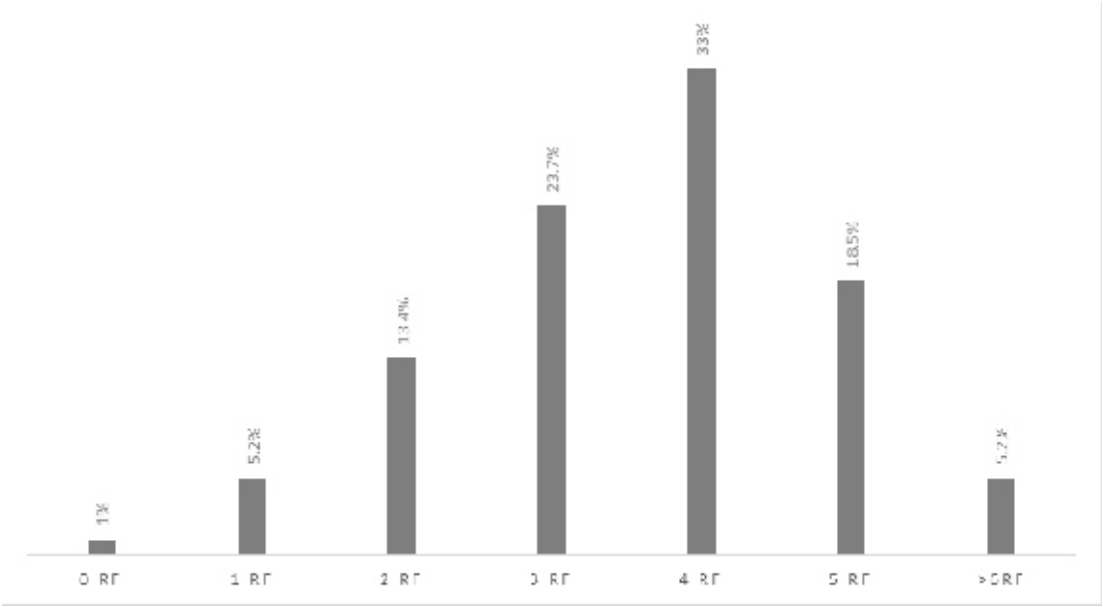
A total number of 97 adult male participants completed the study with a mean age of 56.6 ± 12.6 years (range 35-83 years). The pattern of the cardiovascular risk factors is as shown in Table 1. Half of the hypertensive population was previously diagnosed hypertensive. Table 2 shows the prevalence of each cardiovascular risk factor as distributed across age groups. Obesity and dyslipidemia were seen in 65.0% and 80.4% respectively. The prevalence of impaired glucose/diabetes mellitus and micro-albuminuria were 16.5% and 15.5% respectively. There was high prevalence of alcohol use (75.3%), cigarette smoking (50.5%) and physical inactivity (80.4%). There is a huge clustering of cardiovascular risk factors in this population as shown in figure 1. Almost all (99%) of the population have one or more cardiovascular risk factors, 80.4% had 3 or more cardiovascular risk factors while 5.2% had 6 or more risk factors.

Table 1: Pattern of cardiovascular risk factors classified according to age group.

Risk Factors/Age	31-40yrs N =31	41-50yrs N=30	51-60yrs N=15	61-70yrs N=13	>70yrs N=8	Total N=97
Systolic Blood Pressure(mmHg)	127.2±14.6	144.5±10.6	149.5±11.5	151.5±11.6	155.5±11.4	151.3±11.4
Diastolic Blood Pressure (mmHg)	76.2±14.1	80.3±12.9	85.4±16.7	84.4±15.8	86.1±17.4	85.8±14.7
Total cholesterol (mg/dl)	171.2±40.2	175.2±30.8	171.2±40.5	177.9±41.3	176.9±42.1	174.8±41.6
Weight (Kg)	86.2±14.7	99.0±4.8	111.2±10.2	121.2±12.8	103.8±11.0	104.6±14.8
Height (M)	1.7±8.5	1.7±7.6	1.7±6.9	1.7±5.4	1.7±6.7	1.7±6.8
Body mass Index (Kg/M^2)	29.5±4.4	33.3±2.2	34.4±3.6	35.2±2.8	33.7±3.0	32.7±3.0
Fasting blood glucose (mg/dl)	90.3±11.3	100.3±10.8	109.3±14.9	104.3±13.2	105.3±10.6	100.8±15.0
Waist circumference (cm)	83.9±17.0	93.9±15.4	94.5±12.4	99.7±13.9	98.6±13.9	94.7±14.1

Table 2: Prevalence of cardiovascular risk factors classified according to age group.

Risk Factors/Age	31-40yrs N =31	41-50yrs N=30	51-60yrs N=15	61-70yrs N=13	>70yrs N=8	Total N=97
Hypertension	13(41.9%)	17(56.7%)	12(80.0%)	11(84.6%)	7(87.5%)	60 (61.9%)
Dyslipidemia	22(71.0%)	23(76.7%)	13(86.7%)	13(100%)	7(87.5%)	78(80.4%)
Obesity (BMI)	16(51.6%)	23(76.7%)	12(80.0%)	8(61.5%)	4(50.0%)	63(65.0%)
Impaired GT/DM	3(9.7%)	5(16.7%)	3(20.0%)	3(23.1%)	2(25.0%	16(16.5%)
Visceral Obesity	18(58.1%)	26(86.7%)	12(80.0%)	8(61.5%)	4(50.0%)	68(70.1%)
Micro-albuminuria	2(6.5%)	2(6.7%)	2(13.3%)	4(30.8%)	5(62.5%)	15(15.5%)
Cigarette smoking	15(48.4%)	16(53.3%)	7(46.7%)	7(53.9%)	4(50.0%)	49(50.5%)
Alcohol Intake	24(77.4%)	25(83.3%)	12(80.0%)	7(53.9%)	5(62.5%)	73(75.3%)
Physical Inactivity	22(71%)	26(86.7%)	12(80.0%)	11(84.6%)	7(87.5%)	78(80.4%)



RF- Risk factors

Figure 1: Prevalence of cardiovascular risk factors in the study population

Discussion

This study considered and evaluated 9 cardiovascular risk factors among this solely male population. There was a high prevalence of cardiovascular risk factors among the study group. The prevalence of hypertension in this study was 61.9% which is much higher than the findings from the meta-analysis of blood pressure surveys in Nigeria which documented the overall prevalence of hypertension to be 28.9%, with a prevalence of 29.5 and 25.0% among men and women respectively.21 However, most of the studies analyzed were community based studies done in rural and semi-urban areas.21 More recent primary studies have shown a higher prevalence of hypertension which is comparable to the findings of this study, especially among targeted populations. A report of nationwide survey reported a prevalence of 52.8% in southeastern Nigeria, 44.6% in South-South Nigeria and 42.1% in South-West Nigeria.14 A cross-sectional hypertension survey done in Lagos found a prevalence of 45.5% 20 while a similar study done among university staff in a semi-urban community in South-west Nigeria reported a higher prevalence of hypertension in males compared to females.17 Similarly, a prevalence of 42.0% has been reported among market workers in Enugu 7 and a pilot study of a rural community in South-eastern Nigeria reported a prevalence of 46.4%.13 Even though urbanization may be a plausible reason for the higher prevalence of hypertension in our study, our study population is however bias because more than half of the population was previously diagnosed hypertensive and largely non-compliant with medications.

The prevalence of obesity and dyslipidemia in this study was similar to the findings of a cross-sectional epidemiologic study (Africa and Middle East Cardiovascular Epidemiological (ACE) survey) among patients in general out-patient and non-specialists clinics of

general hospitals.22 About one-third of the participants in the ACE survey had prior diagnosis of dyslipidemia. The similarities in these two studies further emphasize that these risk factors may cluster in patients with previous diagnosis of any of the cardiovascular risk factors (CRFs).

The Prevalence of diabetes mellitus, impaired fasting blood sugar, micro-albuminuria and obesity have previously been reported to be high among urban dwellers and also in western world.27,28 Urban dwelling, physical inactivity, advancing age and unhealthy diet have been proposed as risk factors for DM.27 All these risk factors were noted in our study population and will probably explain the high prevalence of impaired fasting glucose and diabetes mellitus in this study.

Despite the high socio-economic status of our study population, there was still a high prevalence of CRFs. This finding is similar to the study that found a positive linear relationship between monthly income versus BMI and Blood glucose in a CRFs survey in an urban area of Nigeria.18 Similarly in a cross-sectional survey in Southeastern Nigeria, a direct relationship between income and obesity in both men and women was reported.8 Conversely, a study in a diverse population found socioeconomic status to be inversely related to weight and BMI and reported that subjects in the low socioeconomic class had a higher prevalence of obesity. This study was however done in a semi-urban population.9 In the developed world however, high socio-economic status was associated with reduced cardiovascular risk like obesity and dyslipidemia while the low socioeconomic status had higher prevalence of CRFs.28 Individuals in the lowest income group were three times more likely to be obese compared to those in the highest income group. 28 Furthermore, in the French Nutrition and Health Survey of 2006, the risk of overweight and obesity varied across socioeconomic status. 10 In China however, there was no evidence between social status and cardiovascular risk factors probably because of their high level of equity in wealth distribution.11

There was a high clustering of CRFs in this population. Almost all of the population had one or more cardiovascular risk factors. This finding is similar to the ACE survey reported earlier. 22 Similarly, in a population based CRF survey done among urban and rural populations in Abia State south eastern Nigeria, a high prevalence of CRFs and physical inactivity was reported among the study population.29 The prevalence of CRFs in this study population is a cause of concern as there seems to be a looming epidemic of CVD in this group of individuals. Due to this huge CRF burden in this population, urgent intervention has been instituted. Monthly health education sessions have been initiated as part of the social club's activities and members with these clusters have been advised and encouraged to seek medical help. Physical activity, lifestyle changes, compliance with medications, routine comprehensive screening as well as education on proper health seeking behavior is also being reinforced.

Though the results of the study may not be totally generalizable to other individuals with the same socio-demographic characteristics, it will however be expedient to embrace routine CRFs survey in similar target populations nationwide. The World heart Day, World Kidney day and the May Measurement Month may be a perfect opportunities for these surveillance activities. 30 In addition, there is a need for concerted efforts by all stakeholders to reduce CRFs. Also, a large prospective age and sex match study, comparing different individuals within their social strata, will be necessary. This is to determine if cardiovascular risk factors

are gender or social status related.

Conclusion

Cardiovascular risk factors are common among affluent male socialites. There is an urgent need for the inclusion of comprehensive cardiovascular disease prevention programs such as health education programs into Primary Health Care to increase awareness, promote healthy eating habits, encourage physical activities to reduce obesity, avoidance of cigarette and alcohol use, aggressive treatment of cardiovascular risk factors, reinforce need for periodic medical check-up, proper health seeking behavior and early intervention for people with established cardiovascular diseases.

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Conflict of interest

There are no conflicts of interest

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