ABSTRACT

BACKGROUND
Erectile Dysfunction (ED) has been reported to be common among hypertensive male patients. Several reasons have been advanced for this observation. Age-related atherosclerosis is more severe in hypertensive patients compared to normotensive adults. This tends to compromise penile blood flow leading to ED. Other cardiovascular event risk factors have also been implicated. The study was aimed at determining the prevalence and risk factors to ED in a cohort of male patients with high blood pressure who were controlled on regular anti-hypertensive medications.

METHODOLOGY
The study was a cross-sectional study of 101 male patients with high blood pressure who were controlled on regular anti-hypertensive medication. A questionnaire was used to obtain relevant information such as socio-demographic data, duration of hypertensive status, history of diabetes mellitus, history of alcohol intake, cigarette smoking, anti-hypertensive medication, evidence of LVH on ECG and the International Index of Erectile Function (IIEF-5) scores, were obtained from the participants. The data obtained was subjected to relevant statistical analyses.

RESULTS
The patients were between the ages of 39 to 78 years with a mean age of 57.34±9.9. 82% of the subjects had ED of varying degrees. The mean IIEF-5 score was significantly lower in the older age groups (<0.001). The older age groups had a significantly higher prevalence of ED compared to the younger age groups (p=0.041). Patients with longer duration of hypertension had a significantly lower mean IIEF-5 scores compared with patients with hypertension duration of <5 years. There was a negative correlation between age and IIEF-5 scores of the subjects (r=-0.422, p=0.001). Age and duration of hypertension were significant independent predictors of ED in the subjects (OR =18.2, p=0.026 and OR=12.7, p=0.009 respectively).

CONCLUSION
Erectile Dysfunction is common among adult hypertensive Nigerians who were controlled on regular antihypertensive medications. Advancing age and longer duration of hypertension are independent predictors of ED in hypertensive patients.

KEY WORDS: Erectile Dysfunction, Hypertensive Patients, LASUTH, Ikeja.
Pessinaba et al. studied the prevalence of ED in 100 hypertensive males between the age range of 30 to 78 years (mean age 53.3±10.3 years) in Lome, Togo. 53% of the subjects had ED. The study by Bener et al. compared the prevalence of ED in 296 Qatari hypertensive males (mean age 54.8±11.5 years) with 298 Qatari normotensive males (mean age 54.5±12.1 years). In that study, 66.2% of the hypertensive had ED compared to 23.8% in the normotensive subjects. Previous studies have suggested that advancing age is probably the single most important contributor to the incidence of erectile dysfunction in men. Fafiolu et al. reported a prevalence of 75% with erectile dysfunction among 101 hypertensive patients compared to 56.9% among normotensive counterparts. Old age was the most significant risk factor for ED in that study as individuals who were within the age brackets of >45 years and above, were 3 times more likely to have ED compared to those younger than 45 years. Oladiji et al. reported an ED prevalence of 46.9% in their study in Ilorin among 399 men aged between 20 to 70 years. Apart from advancing age, duration of marriage and spousal status were the other determinants of ED in that study. The prevalence of ED was inversely correlated to the number of wives that the married men had. The presence of left ventricular hypertrophy (LVH) on the electrocardiogram (ECG) which is a marker for target organ damage in hypertensive heart disease, could also possibly be a surrogate marker for ED in hypertensive patients. Busari et al. in their study among 85 newly diagnosed male hypertensives, revealed that hypertensive with ED had a higher prevalence of electrocardiograph LVH compared to hypertensive patients without ED. The rest ECG features of ischaemic heart disease are not specific for coronary artery disease since they could also be present in other cardiac diseases such as cardiomyopathies. This would have been a better surrogate marker for atherosclerosis-induced erectile dysfunction.

Antihypertensive medications have also been reported to contribute to incidence of ED in hypertensive patients. The study by Okehialam et al. suggested that hypertensive patients on thiazide diuretics are particularly at risk of ED. Older generation antihypertensive medications such as α-methyldopa, β-Blockers and thiazide diuretics have been implicated in the reported high prevalence of erectile dysfunction in male hypertensive patients. Newer antihypertensive medications such as calcium channel blockers, Angiotensin converting enzyme inhibitors (ACEI) and Angiotensin receptor blockers have been reported to have neutral or sometimes beneficial effects on erectile functions. Also, newer β-blockers such as Nevibolol, have also been reported to improve sexual function in hypertensive patients. Erectile dysfunction due to effect of antihypertensive medications are more likely to occur within weeks or months of the initiation of the antihypertensive drug therapy. This is in contrast to erectile dysfunction due to long standing hypertension-induced atherosclerosis, which tends to develop overtime after years of hypertensive status.

The most widely accepted and validated method for assessing erectile dysfunction is the international Index of Erectile Function (IIEF-5). The IIEF was developed in conjunction with the clinical trial program for sildenafil, and has since been adopted as the ‘gold standard’ measure for efficacy assessment in clinical trials of ED. The IIEF was recommended as the efficacy endpoint of choice for clinical trials in ED, by the 1st International Consultation on Erectile Dysfunction, sponsored by the World Health Organization. Rhoden et al. showed that the IIEF-5 is a simple diagnostic tool that could be used to screen for ED in a large population of patients. Rosen et al. reported that the IIEF-5 has been adopted as the gold standard for screening for ED in clinical trials and linguistically validated in at least 32 languages. It has a high degree of sensitivity and specificity and meets psychometric criteria for reliability and validity. It is also useful in evaluating treatment outcomes in patients with ED. However, other screening tool such as the International Index of Sexual Health Inventory for Men (SHIM) have also been used for screening for ED by some studies. The SHIM is an abridge 5-item version of the IIEF-5 that is simpler to administer.

The aim of our study was to screen for the prevalence of ED in a cohort of male hypertensive patients attending the Medical Outpatient Clinic. The study also tried to determine the other possible risk factors for ED.
in these patients such as age, duration of hypertensive status, BMI status, alcohol and cigarette use, antihypertensive medication and the presence of LVH on ECG recordings. There are still very few reports on ED in hypertensive Nigerians.

**METHODOLOGY**

101 Male hypertensive patients who attended the Medical Outpatient Clinic of the Lagos State University Teaching Hospital, Ikeja, and were controlled on current antihypertensive medications, were consecutively recruited into the study by convenience sampling. The **SAMPLE SIZE ESTIMATION FOR CROSS SECTIONAL STUDY** was determined by the following calculation

\[ n = \frac{z^2pq}{d^2} \]

Where:  
- \( n \) = the desired sample size 
- \( z \) = the standard normal deviate, corresponding to 1.96 to the 95 percent confidence level (or 5% significant level) 
- \( p \) = the proportion of erectile dysfunction among hypertensive patients from previous study =0.53 (when prevalence was 53%) 
- \( q = 1.0 - p = 0.47 \)
- \( d = \) degree of accuracy desired set at 0.1

\[ n = \frac{(1.96)^2(0.53)(0.47)}{(0.1)^2} \]

\[ n = 95.69 \]

A total of 101 hypertensive was recruited.

The patients were administered a questionnaire that obtained details about their demographic data such as age, weight, height, marital status, duration of hypertension, diabetic status, alcohol use, cigarette smoking history and antihypertensive drug use. The patients body mass index (BMI) was derived from the formula: BMI=weight in kg/(height in m)^2. Patients had their ECG results analysed for the presence of LVH by voltage criteria using the Sokolow-Lyon criteria which state that SV1 + RV5 or RV6≥ 40mm = LVH by voltage criteria. Patients with uncontrolled hypertension (BP≥150mmHg systolic), history of excess alcohol intake (≥3 units/day), heart failure or other debilitating ailments, were excluded from the study.

The patients were evaluated for their erectile function using the IIEF-5 erectile function screening tool. The IIEF-5 erectile function screening tools measures 5 erectile function parameters. Each of these parameters has a minimum of 1 and a maximum of 5 scores depending on the individual response. The 5 parameters assessed include: (1) Confidence in achieving and sustaining erection. (2) Ability to achieve a hard erection for penetration. (3) Ability to maintain erection after penetration. (4) Ability to maintain erection till end of sexual intercourse. (5) Satisfaction with overall performance of sexual intercourse. The erectile function was classified into 5 grades according to the total score obtained by each subject; severe ED (5-7), moderate ED (8-11), mild to moderate ED (12-16), mild ED (17-21), normal erectile function.

The data obtained were entered into an excel spreadsheet and subsequently analysed with SPSS version 20. Categorical variables were analysed using chi square while continuous variables were analysed using the student t test. Authors compared the means of 3 groups using ANOVA. The relationship between age and erectile function status was determined using Spearman correlation coefficient. Binary logistic regression analysis was performed to determine independent predictors of erectile functions status. Statistically significant difference was set at p values≤0.05.

**RESULTS**

62.4% of the subjects were middle age while 28.7% were elderly hypertensive (Table 1). 79.2% of the subjects were married while 15.6% were either separated, divorced or widowed. 9.9% were diabetic while up to 71.3% had history of alcohol use. 27.7% of the patients listed α-methyldopa as part of their antihypertensive medications. Figure 1 showed the spread of the subjects erectile function status based on their IIEF-5 scores. 17.8% of the patients had normal erectile function while 82.2% of the patients had erectile dysfunction of varying severity. 33.6% of the patients had moderate to severe erectile dysfunction.

Patients with longer duration of hypertensive status have lower mean IIEF-5 scores. The post Hoc analyses of Tables 2(a and b) revealed that the mean comparison of Young with elderly Hypertensive patients IIEF-5 Scores was significant (p=0.001), and Middle aged compared to elderly patients was also significant (p=0.001). Mean comparison between extreme of duration of hypertension (1-<5 and ≥10) was significant (p=0.037), and
Mean comparison between (1-<5 and 5-<10 was also significant (p=0.032). The mean comparison of the IIEF-5 Scores of the hypertensive with different BMI categories were insignificant

Nine out of the 10 diabetic-hypertensive patients have erectile dysfunction (Table 3). There was no significant difference in the prevalence of ED between those who took alcohol moderately or not at all. Only a small number of the subjects smoked cigarette and this did not have significant effect on their ED status. There was no significant effect of use of α-methyl dopa on the erectile dysfunction status of the subjects. Age of 65 years and above, and duration of hypertensive status of 5 years or more, were significant independent predictors of Erectile function status in male hypertensive patients (Table 4).

Figure 2 showed a negative relationship between erectile function scores and advancing age. Out of the 53 patients with ECG results, 29 had LVH by voltage criteria or with strain. Tables 5(a and b) did not show any
significant difference in the prevalence of ED in patients with LVH on ECG when compared to patients without LVH on the ECG.

**DISCUSSION**

The study suggest that ED is particularly common in hypertensive men and more prevalent in the older age groups. This is consistent with the findings of previous studies. 82% of adult hypertensive in the present study had erectile dysfunction compared to 75% in the study of 101 hypertensive adults (mean age 49.74±16.6) by Fafiolu et al. 2 This was significantly higher than
the 56.9% of normotensive adults with erectile dysfunction in that study. The prevalence of ED in the present study is higher than the 53% reported by Pessinaba et al in their study among 100 hypertensive males between the age range of 30 to 78 years (mean age 53.3±10.3 years) in Lome, Togo. Ghalayini et al. revealed that about 40% of men aged 60 years and above had ED while at least 50% of men aged 70 years and above had ED. Similarly, Tan et al showed that 40% of men aged 60 years and above had ED while almost 80% of men aged 70 years and above had ED. That study suggested that age 50 years and above, was the most significant risk factor for ED in men. Ponholzer et al. and Madersbacher et al., both reported similar prevalence of ED in men aged 60 years and above. The slightly higher prevalence of ED in the present study compared to previous studies quoted above, might be partly due to the higher mean age of the hypertensive subjects in the present study.

There was no significant difference in the erectile function status of subjects with higher body mass index compared with individuals with normal body mass index. This is unlike the findings of previous studies which suggested that overweight and obese individuals are more likely to suffer from ED. Pessinaba et al., reported a higher prevalence of ED among obese subjects compared to subjects with normal weight. ED was particularly high among subjects with abdominal obesity in that study. Patients with longer duration of hypertensive status in this study had significantly lower erectile function score. This is similar to the findings of previous studies. Pessinaba et al., reported that hypertensive subjects with 5 years or more duration of hypertensive status, had significantly higher prevalence of ED compared to men with hypertension of less than 5 years duration. Nine out of the 10 diabetic-hypertensive patients in the study had ED. Patients with long duration of diabetes mellitus are at risk of advance atherosclerotic vascular disease and diabetic autonomic neuropathy, which could both predispose to ED. There was no significant difference in the erectile function status of hypertensive subjects who took alcohol moderately compared to hypertensive subjects that abstained from alcohol intake. This is similar to the findings of Oyelade et al in a recent population-based study. Alcohol intake has been reported to show a J Curve relationship with ED, just as is the case with its relationship with coronary heart disease. Moderate alcohol intake confers the best benefit on erectile functions because of the reported anti-oxidants and vasodilatory effect of alcohol. Only a few of the patients smoked cigarette and this did not have any significant effect on their erection status. Cigarette Smoking is known to be associated with accelerated atherosclerotic vascular disease which could possibly compromise penile blood flow.

There was no significant difference in the erection status score of patients on α-methyldopa antihypertensive medications compared to patients that were not on the medication. This is contrary to literature reports that suggest that ED is a noted side effect of central acting drugs such as α-methyldopa. It should be mentioned that compliance to antihypertensive medication by the subjects could not be ascertained and this might partly explain the findings in this study. Most of the subjects have been on combination antihypertensive medications at one point or the other. This could have blunted the effects of each individual antihypertensive class of drugs on the erectile function status of the subjects. Unfortunately, the data on previous antihypertensive drug medications taking by the patients was not too reliable as stated earlier. The presence of LVH on ECG did not affect the erectile function status of the patients. This is contrary to the report of the study by Busari et al, which suggested that male hypertensive with ED have a significant prevalence of electrocardiograph LVH compared to male hypertensive without ED. However, the population of those with LVH on ECG in the present study is relatively small and may not be a true reflection of the situation. Since the presence of LVH is a marker for target organ damage in hypertensive heart disease, it could possibly serve as a surrogate marker for atherosclerosis-induced ED in hypertensive patients.

**CONCLUSION**

The study showed a high prevalence of ED in hypertensive male patients. It also confirms that advancing age and longer duration of hypertensive status are significant risk factors.
to ED. Attempts should be made to address this sensitive but highly distressing issue during consultation with the patients.

LIMITATION.
The relatively small sample size of the study sub-groups made it difficult to make categorical statistical deductions on the effect of some of the variables on ED status of hypertensive males. Also, the effects of the various antihypertensive drugs on erectile dysfunction could not be studied in details because most of the subjects were on combination and unbranded antihypertensive drugs. A subsequent larger study should further shed light on this interesting subject.

DECLARATION OF INTEREST: The authors report no conflict of interest.

REFERENCES
15. Temml C, Racz U, Mock K, Ponholzer A,


