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THE BURDEN OF ERECTILE DYSFUNCTION IN HYPERTENSIVE MEN ATTENDING A GENERAL OUT PATIENT UNIT IN A RURAL NIGERIAN HOSPITAL

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## THE BURDEN OF ERECTILE DYSFUNCTION IN HYPERTENSIVE MEN ATTENDING A GENERAL OUT PATIENT UNIT IN A RURAL NIGERIAN HOSPITAL

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### ABSTRACT

**Background:** Hypertension is often cited as a cause of erectile dysfunction (ED) which is currently known to be a risk factor for coronary artery disease (CAD). Both ED and CAD lower the quality of life of affected men.

**Objectives:** To study the characteristics of men with hypertension-associated ED and to determine the ED burden in hypertension in this rural community.

**Design:** Questionnaire based cohort study.

**Setting:** The General Out Patient unit of Irrua Teaching Hospital, Nigeria.

**Subjects:** Men attending the General Out Patient Unit during the study period for diagnosis and treatment of hypertension and who consented to the study.

**Outcome Measure:** The burden of ED in hypertensive men and the characteristics of such men.

**Result:** Two hundred and forty two respondents correctly filled and submitted the questionnaire. Fifty four (22.41%) were newly diagnosed, untreated while 188(77.59%) had been on treatment. In the untreated group, 40(74.07%) and in the treated group, 166(86.20%) had some degree of ED compared to 57.4% in the general population. Age( $p=0.000$ ), BMI( $P=0.010$ ) in the newly diagnosed group and age( $p=0.001$ ), duration of treatment( $p=0.009$ ) and co-morbidities( $p=0.010$ ) in the treated group were risk factors for ED. Majority of the men(80.30%) were on combination therapy.

**Conclusion:** ED is common among hypertensive men, treated or untreated. Considering the socio-economic and clinical effects of CAD for which ED is a fore runner, physicians should endeavour to obtain a sexual history when evaluating these men as a preventive measure against future cardiovascular event.

### INTRODUCTION

Penile erection is a complex hydraulic process that is initiated and controlled by the nervous system. It elicits a profound physiological response from the cardiovascular system (CVS), the end result being the dilatation of the cavernosal arteries and filling of the cavernous sinuses. The neurotransmitter involved in this process has been documented to be nitric oxide (1) while the control centre in the central nervous system (CNS) is the Onuf nucleus located in S2-4 with input from the higher centres. The stimuli which bring about penile erection include sight, thought

and smell related to sex, touch and nocturnal penile tumescence. This forms the basis for the classification of abnormalities of penile erection into psychogenic, neurological and vasculogenic (2).

Erectile dysfunction is the inability to achieve and or maintain penile erection sufficient for satisfactory sexual intercourse (3). Originally thought to be part of the aging process for which there was no treatment, numerous variables are now known to be responsible for it with a cause-effect relationship (4). These include obesity, hyperlipidaemia, cigarette smoking, alcohol consumption, low testosterone level, diabetes mellitus and hypertension. These factors initiate

and or perpetuate endothelial dysfunction and atherosclerotic narrowing of arterial blood vessels because of which they are referred to as cardiovascular risk factors.

Blood pressure is a variable that changes with age. However, the world health organisation defines hypertension as a blood pressure more than or equal to 140/90mmHg in an adult. Hypertension causes endothelial dysfunction by the sheer stress of a raised blood pressure on the endothelium (5). This damage causes inflammatory changes, impairment of nitric oxide metabolism and an increased movement of lipids into the media, a sine qua non for atherosclerosis. Involvement of the pudendal artery in this atherosclerotic process is presently considered as the cause of vasculogenic erectile dysfunction. For this reason, hypertension is often cited as a risk factor for ED, an association usually attributed to the drugs used for treatment or these vascular changes.

Hypertension and ED are variables which can lower the quality of life of affected men. While hypertension is known to predispose to coronary artery and ischaemic brain diseases, ED is presently considered as a sentinel event (6) for these diseases. Irrua Teaching Hospital sub-serves a rural population of four million people though a few of the patients attending the GOPD are urban based. The aim of this study is to assess the burden of ED in hypertensive men and also, to study the characteristics of these men in this basically rural, predominantly low resource community.

## MATERIALS AND METHODS

This was a questionnaire based study of erectile dysfunction in hypertensive men. Following approval by the ethic committee of the hospital, the questionnaire was distributed to all hypertensive men attending the General Outpatient for diagnosis and or treatment. They were given a quite lonely place

to sit and fill the forms after they have been attended to for the day. Those who opted to go home with it were advised to return the questionnaire during their next visit while interpretation was offered by a senior registrar to those who needed it.

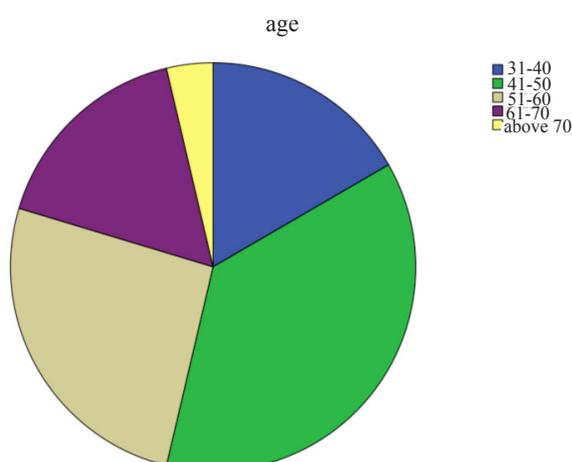
The questionnaire consisted of seven sections. The first section was made up of consent to participate in the study which the patient was expected to sign before proceeding to the next section. Section 2 contained information about the patients biodata (age, marital status, occupation) while section 3 was about the patients anthropometric measurements (height, weight, body mass index). Name and hospital number were omitted in order to ensure confidentiality. Section 4 centred on information about diagnosis, duration of treatment and the class of drugs used in the treatment of the hypertension. Information on co-morbidities and the drugs used in their treatment formed the nucleus of section five. Such co-morbidities included diabetes mellitus, prostatic diseases, arthritis, chronic renal failure and eye diseases.

The second page of the questionnaire consisted of the validated five item international index of erectile function (IIEF 5). Finally, digital rectal examination was done and findings documented. The information obtained from all these sections was analysed using simple statistical methods, and statistical programming for social sciences (SPSS) version 17.

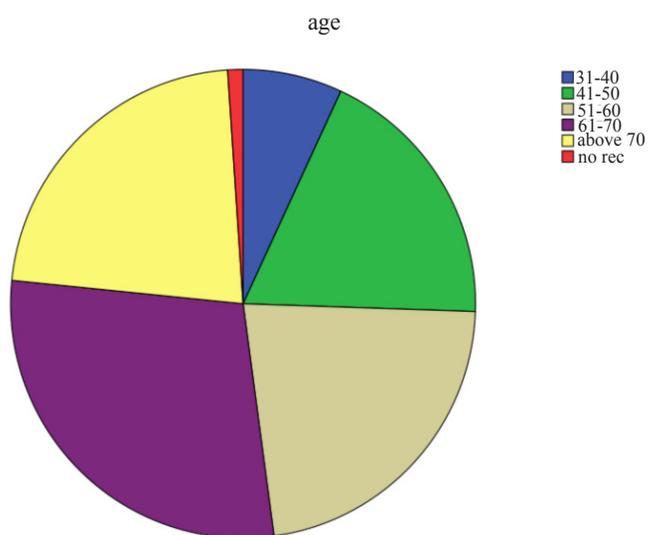
## RESULT

A total of two hundred and forty two participants validly filled and returned the questionnaires. Fifty four of them (24%) were newly diagnosed hypertensive men while 188 (76%) had been on various anti-hypertensive for a variable period of time. The age distribution of these two groups is shown below.

**Figure 1a**  
*Age distribution of untreated men*



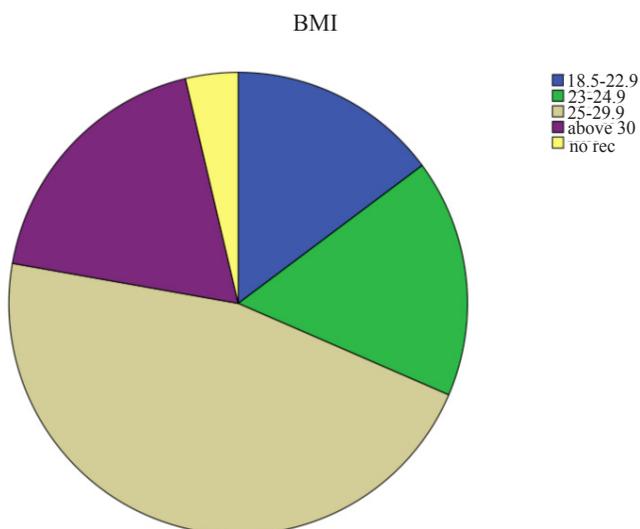
**Figure 1b**  
*Age distribution of treated men*



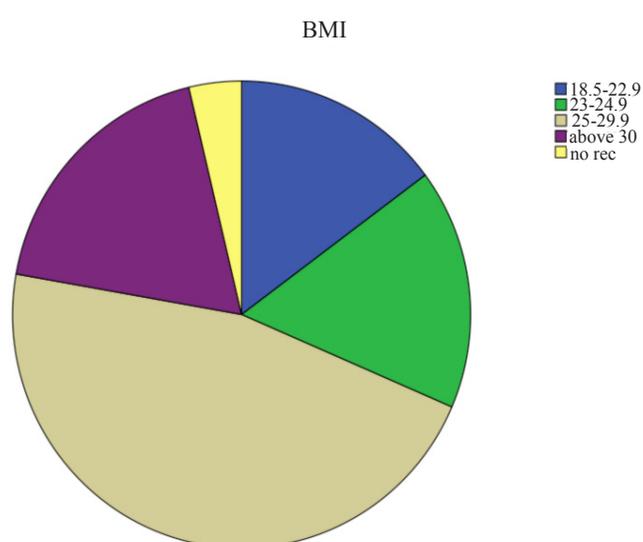
Of the 54 newly diagnosed hypertensive men, using the Hospital Authority of Hong Kong classification of body mass index (BMI), eight (14.8%) were normal, nine (16.7%) were at risk for obesity, 25 (46.3%) were overweight and moderately obese, ten (18.5%) were severely obese while the remaining two (3.7%) had no records on height and weight to enable the calculation of BMI. Using the same classification for

the 188 men who had been on treatment, one (0.5%) was under weight, 32 (17%) were normal 30 (16%) were over- weight and at risk for obesity, 84 (44.7%) were moderately obese, 29 (15.4%) were severely obese. The remaining 12 (6.4%) had no records on height and weight to enable the calculation of body mass index. Figure 2a

**Figure 2a**  
*BMI of untreated men*



**Figure 2b**  
BMI of treated men



Diabetes mellitus, benign prostatic hyperplasia (BPH), arthritis, chronic obstructive pulmonary disease (COPD) and chronic renal failure were the common co-morbidities in this group of men. In the non-treated, newly diagnosed group ten (18.5%) were diabetic, six (11.1%) had BPH, four (7.4%) had one or the other of the above mentioned co-morbidities

while the remaining 34 (63%) had no co-morbidities or such was not recorded. Among the 188 treated hypertensive men, 42 (22.3%) were diabetic, 43 (22.9%) had BPH, 7 (3.7%) had chronic obstructive pulmonary disease, one (0.5%) had arthritis, six (3.2%) had other co-morbidities while 89 (47.3%) had no co-morbidities or such was not recorded. Table 1a and 1b.

**Table 1a**  
*Distribution of co-morbidities of untreated men*

Co-morbidity	Frequency	Percent	Valid Percent	Cumulative Percent
Valid DM	10	18.5	18.5	18.5
BPH	6	11.1	11.1	29.6
others	4	7.4	7.4	37.0
norec	34	63.0	63.0	100.0
Total	54	100.0	100.0	

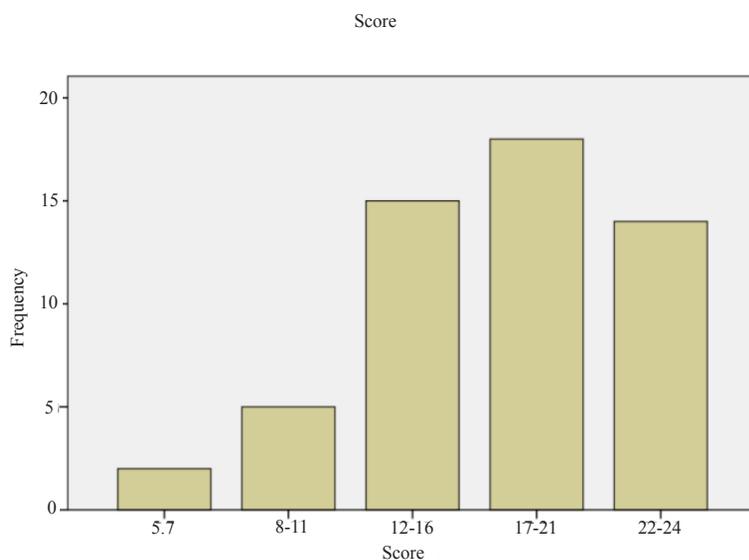
**Table 1b**  
*Distribution of co-morbidities of treated men*

Co-morbidity	Frequency	Percent	Valid Percent	Cumulative Percent
Valid DM	42	22.3	22.3	22.3
BPH	43	22.9	22.9	45.2
arthritis	1	.5	.5	45.7
COPD	7	3.7	3.7	49.5
Others	6	3.2	3.2	52.7
no rec	89	47.3	47.3	100.0
Total	188	100.0	100.0	

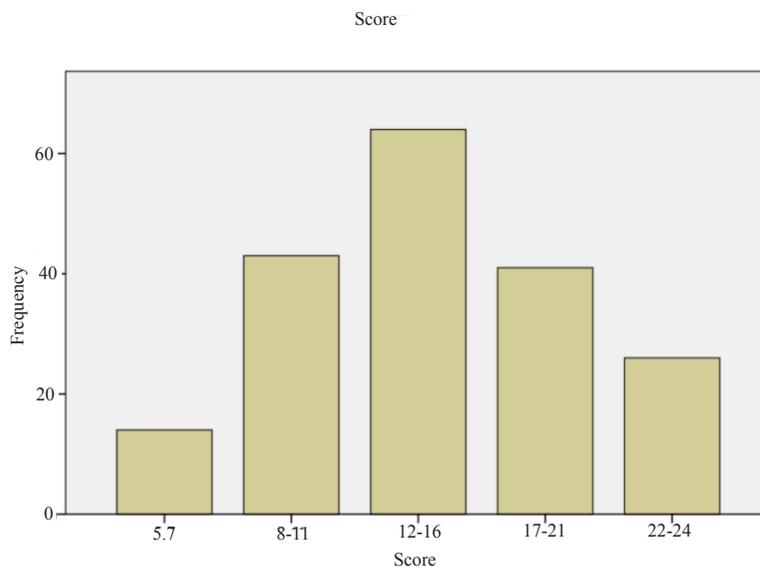
The international index of erectile function (IIEF 5) was used for the assessment and scoring (Figure 4a and b). Of the fifty four newly diagnosed hypertensive men, two (3.7%) had severe ED while 14 (25.93%) had normal erectile function. In the treated group, 14 (7.4%) had severe ED while 26 (13.8%) had normal erectile function indicating that treatment may have effect on erectile function ( Figure 4a and b). Overall, in the newly diagnosed non treated group, 40 (74.07%) had ED while in the treated group, 162 (86.20%) had ED. In the untreated newly diagnosed group, when age was cross tabulated with scores, Chi-square was

statistically significant ( $P = 0.000$ ) (like hood ratio = 0.000). In the treated group, there was also a significant correlation ( $P=0.001$ ) (like hood ratio = 0.000). When the same was done for the other variables, the results were for the non treated group: BMI ( $P = 0.010$ ) (like hood ratio = 0.005) co-morbidities ( $P = 0.831$ ) (like hood ratio=0.079). In the treated group, the findings were; BMI ( $P=0.059$ ) (like hood ratio=0.231), duration of treatment ( $P=0.009$ ) (like hood ratio=0.005), drugs used for treatment ( $P=0.113$ ) and co-morbidities ( $P=0.010$ ) (like hood ratio= 0.001).

**Figure 4a**  
*Distribution of IIEF scores of untreated participants*



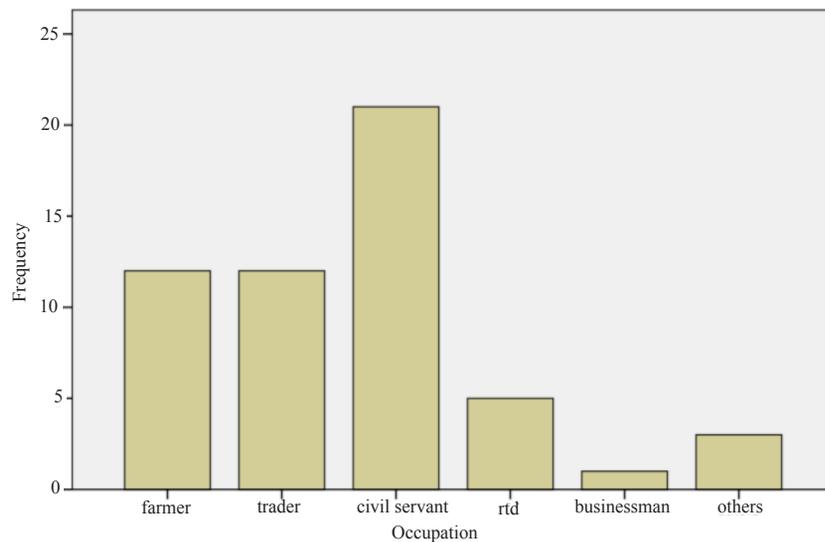
**Figure 4b**  
*Distribution of IIEF scores of treated participants*



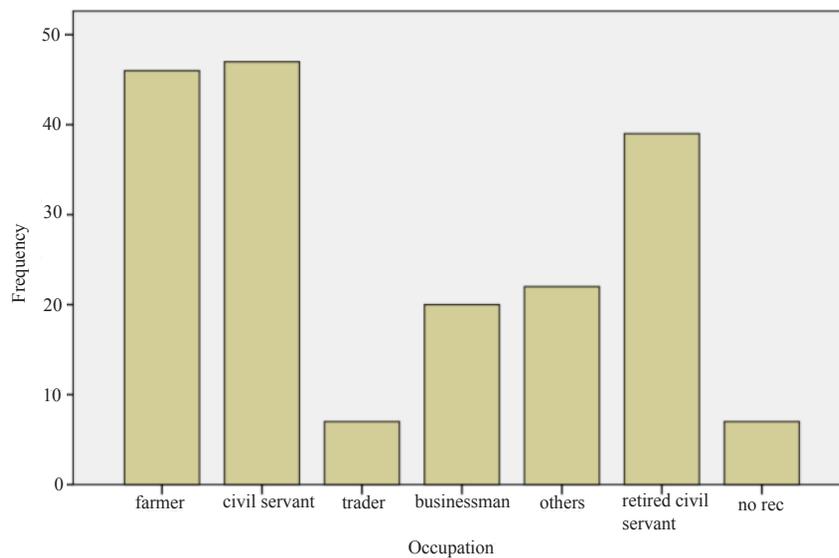
Various drug combinations were used in the treatment of the 188 men in the treated group. Of these 188, 13 (6.9%) were on ACE, calcium channel blockers and diuretics, 31(16.5%) were on calcium channel blockers and diuretics, six (3.2%) were on ACE and calcium channel blockers, 29 (15.4%) were on ACE and diuretics, 23 (12.2%) were on centrally acting

anti-hypertensive in combination, 36 (19.1%) were on alpha blockers, beta blockers in combination with another anti-hypertensive, 13 (6.9%) were on other various combinations while 19 (10.1%) were on diuretics alone. There was no treatment records in 18 (9.6%) of the patients. See Figure 5a and b for the occupational distribution of the participants.

**Figure 5a**  
*Occupational distribution of untreated men*



**Figure 5b**  
*Occupational distribution of treated men*



## DISCUSSION

ED is a common disease among aging men and current opinion points to a vascular origin(7). According to Kenia Pedrosa Nunes,(8) ED affects 30 million American men some of whom are certainly hypertensive. Its effects on the quality of life are legion, to the extent that Korean men recognise it as being as serious as haemodialysis, dementia, and early stage cancer(9). This underscores the need for its early recognition, prevention, and treatment.

In Nigeria, according to Essien *et al* (10), systemic hypertension is the most common non-communicable disease in adults and hypertension and diabetes mellitus often co-exist. This indicates that ED may be a common phenomenon among aging men in this developing nation. The common association between diabetes mellitus and hypertension and the combined effect on erectile function is further confirmed in this study(22.9%). According to Severo *et al*(11) in high cardiovascular risk hypertensive individual with type 2 DM, ED is highly prevalent.

ED is more prevalent and more severe in hypertensive men than the general population as documented by the work of Buchardt *et al* (12) in which ED was present in 68% of the hypertensive men. This is slightly lower than in our study where 74.07% had some degree of ED in the newly diagnosed non treated group and 86.20% in the treated group. This is in contrast to the 57.4% prevalence in the general Nigeria population attending GOPD(13) further strengthening the existing data that hypertension causes ED while drugs used in its treatment may cause or worsen existing ED.

Obesity alone(14) or in association with the metabolic syndrome(MS) has been well documented as a risk factor for cardiovascular disease and ED through endothelial dysfunction. This endothelial dysfunction results from the low chronic inflammatory state which is present in MS. This explains the statistical significance of BMI in the newly diagnosed non treated ( $P=0.010$ ) and the nearly significant correlation in the treated group ( $P=0.059$ ). The seemingly high prevalence of obesity in this low resource community can be mostly explained by the large population of civil servants, business men and traders among the respondents and who often lead a sedentary life style and whose diet may be largely carbohydrate based.

Age remains the only (15) independent risk factor for ED and this is shown in this study in both the newly diagnosed non treated group ( $P = 0.000$ ) and in the treated group ( $P=0.001$ ). The duration of treatment ( $P = 0.009$ ) appears to be a strong independent variable but it can hardly be divorced from age as the older the patient the longer the duration of treatment is likely to be. The peak age of diagnosis of hypertension in

this study is in the fifth decade of life with a peak IIEF score of (untreated men) 17-21 (mild ED). Aging is often associated with other morbid conditions which impact on the health of men and their erectile function. Some of these co-morbidities are risk factors for ED and may have contributed to the higher burden of ED (treated men) in this study as participants with these diseases were not excluded. These may explain the score migration twenty years later(in the treated men, 7<sup>th</sup> decade of life) to IIEF score of 12-16 (moderate ED). The implication of this is that with aging, the duration of treatment of hypertension increases, co-morbidities(such as DM, prostatic diseases) with negative impact on erectile function emerge and further worsen the ED.

The drug treatment of hypertension has been well documented as contributing to the burden of ED in hypertension. While some combinations are considered as beneficial, others may cause or exacerbate existing ED (16). Most of the men (80.30%) in this study were on combination anti-hypertensive therapy which seemed not to have considered their effect on erectile function. This may have contributed to the aforementioned higher burden of ED in the treated group. It underscores the need for the physicians to be knowledgeable about the sexual side effects of anti-hypertensive drugs and to include erectile function in the clinical evaluation of these men as we live in a community where cultural inhibitions and gross diseases still weigh down these men. Additionally, it exposes the need for interdisciplinary cooperation between the Urologist who manages these men for their ED and the Physician as ED side effect of these drugs is often a cause of non compliance. This deliberate approach may help in the prevention of feature cardiovascular events.

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