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Assessment of Cardiovascular Disease Risk Factors of Adult Male and Female Diabetic Patients Attending Nnamdi Azikiwe University Teaching Hospital, Nnewi, Anambra State, Nigeria.

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Abstract: **Diabetes mellitus is a prime risk factor for cardiovascular disease and ia a major cause of death in both developing and developed countries.**
Objective: The study was carried out to assess the cardiovascular risk factors and to predict the gender that may likely die of cardiovascular disease in the next ten (10) years in Nnewi, Anambra State, Nigeria.
Method: A total of 50 adult diabetic subjects comprised of 31 males and 19 females, who attend Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi, took part in this study. The study design was a case study. Ethical approval was obtained from the Ethics Review Committee and written informed consent was obtained from each participant. Also, questionnaire was used to obtain their biodata and the risk levels of both modifiable and non-modifiable factors. Fasting blood samples were drawn from the subjects for biochemical assays. A Framingham cardiovascular risk score was used to determine the risk of the individuals to cardiovascular disease (CVD). Student t-test was used for data analysis.
Results: The age (years) of males was the same with that of the females at $p>0.05$.The mean Systolic blood pressure (SBP) and diastolic blood pressure (DBP) values were significantly higher in male subjects compare to the female subjects ($p<0.05$). The mean FBS was not significantly different between both genders ($p>0.05$). The serum levels of high density lipoprotein (HDL) and total cholesterol (TC) were not significantly different both genders ($p>0.05$). The Framingham cardiovascular risk score was significantly higher in male subjects than in female subjects ($p<0.05$).
Conclusion: The findings observed a greater risk of death from cardiovascular events within ten years in men than in women of the same age bracket.

Keywords: **Cardiovascular disease, Framingham risk calculator, gender.**

1. INTRODUCTION

Heart disease is a general term for a variety of heart conditions; it includes coronary diseases such as angina and myocardial infarction also known as heart attack.[1] There are other examples of CVD such as stroke, hypertensive heart disease, rheumatic heart disease, cardiomyopathy, heart arrhythmia and venous thrombosis [1,2], with each disease having

its underling mechanism. Coronary artery disease, stroke and peripheral artery disease are linked to atherosclerosis, which may be induced by high blood pressure, smoking, diabetes, physical inactivity, obesity, high blood cholesterol, poor diet and excessive alcohol intake. [1]

CVD is the leading cause of mortality globally.[1] Coronary artery disease and stroke account for 80 % of CVD death in males and 75 % of CVD deaths in females. [1] Most CVD affects older adults. Studies have it that 11 % of people between 20 and 40 years have CVD 37 % of people between 40 and 60 years have CVD, 71 % of people between 60 and 80 have CVD and 85 % of people over 80years have CVD in developed world. [3] But the average age of death in developing world is around 68 %.[4] Report has it that Africa has witnessed tremendous lifestyle changes and urbanization; which increased the incidence of CVD. [5]

Atherosclerosis and hypertension are the most common cause of about eighty percent of the coronary heart disease and the cardiovascular disease cases are as a result of behavioral risk factors. [6] The most important behavioral risk factors are unhealthy diet, physical inactivity and smoking which lead to effects such as increased blood pressure, increased blood sugar levels, increased blood lipid levels, overweight and obesity. [6] Other risk factors not preventable are increasing age, male gender, family history and genetic disposition.[7,8] Deaths from cardiovascular events have been reported to progressed with age in both genders. [9] The disease onset is 7 to 10 years in men than in women. [10]

It has been reported that 90 % of CVD is preventable. [11] A diet high in fruits and vegetables intake and low intake of sweets, red meat and trans- fatty acid [12, 13] have been shown to reduce blood pressure [14] and improve metabolic syndrome.[15] Moderate evidence has it that high salt intake increases cardiovascular mortality.[16]

The Framingham risk score is a gender specific algorithm used to estimate the ten years cardiovascular risk of an individual. [17, 18] The Framingham risk score gives the result of the patient's risk score and predicts the risk of death due to cardiovascular disease by comparing the values to an average value for a person of the same sex and age. [19] Therefore, as a result of the increase number of people suffering from hypertension and diabetes, it is pertinent to urgently assess the risk of death from cardiovascular disease in individual living in Nnewi, hence the aim of this study.

2. MATERIALS AND METHODS

A total of 50 adults diabetic subjects (31 males and 19 females) aged 35 years and above, who attended NAUTH, Nnewi Anambra State were randomly recruited for this study. Questionnaire was used to collect individual Biodata and lifestyle status which were used in the Framingham risk calculator.

5ml of venous blood sample was collected from each subject. FBS was determined by glucose oxidase system using the one-touch glucose monitoring system (Life Scan Inc, Johnson- Johnson Company, USA) [20] and diabetes defined using WHO recommendations. [21]

The remaining blood sample (4ml) was dispensed into a plain tube, allowed to clot, centrifuged and the serum dispensed into plain tube for lipid profile assay. Total cholesterol was estimated by enzymatic hydrolysis and oxidation of cholesterol by the method of Allain *et al*, [22] Serum, HDL was estimated by precipitation method described by Assmann *et al*, [23]. Serum Triglyceride was estimated by enzymatic hydrolysis by the method of Buccolo and David [24], HDL was estimated by precipitation method described by Assmann *et al*, [25] and LDL was estimated and was calculated as described by Kaplan *et al*,. [27] The reagents used were prepared by Randox Laboratory Ltd., UK.

High blood pressure was defined according to the WHO guideline: a SBP ≥ 140mm/Hg or DBP ≥90mm/Hg or being on treatment.[26] The SBP and DBP of the subjects were measured and recorded accordingly using sphingnomanometer.

The data collected from this study were keyed into the risk score Framingham calculator, which provides coronary heart disease risk at 10 years in percent. [27] The statistical analysis was done using SPSS version 16. Data collected were expressed as mean ± SD and subjected to student unpaired t- test. The acceptable level of significance was $p<0.05$.

3. RESULTS

Table-1 shows the mean risk factors studied. The mean age (years) of males was not significantly different from that of the females at $p>0.05$.The mean SBP, DBP and the serum levels of triglycerides and LDL were significantly higher in

male subjects than in female subjects ($p<0.05$) respectively. There were no significant different ($p>0.05$) in the mean FBS, total cholesterol and HDL between the genders, although the male subjects had higher serum values. The Framingham cardiovascular risk score was significantly higher in male subjects than in female subjects ($p<0.05$).

Table-1: Means of Framingham Cardiovascular Risk Factors

Risk Factors	Males (n=19)	Females (n=31)	p- value
Framingham Score (%)	23.94 ± 8.72	15.45± 6.95	<0.05
Age (Years)	56.68 ± 7.42	54.84 ± 8.34	>0.05
Total chol (mmol/l)	4.51± 1.34	4.45 ± 1.45	>0.05
HDL (mmol/l)	0.94 ± 0.44	0.87 ±0.46	>0.05
FBS (mmol/l)	6.27 ±2.39	6.92 ±3.44	>0.05
SBP (mmHg)	139.05 ± 6.12	135.51 ± 5.80	<0.05
DBP (mmHg)	81.74 ± 13.30	74.87 ± 13.42	>0.05
TG (mmol/l)	1.36±0.45	1.29±0.05	<0.05
LDL (mmol/l)	2.50±1.08	2.30±0.98	<0.05

4. DISCUSSION

The study gives clue on the risk of death from cardiovascular causes in the next ten years of individuals with some cardiovascular risk factors. The Framingham cardiovascular risk score used in this study were based on individual age, gender, total cholesterol, HDL- cholesterol, smoking status, systolic blood pressure and state of any medication to treat high blood pressure. The information was aided by questionnaire. The DBP was not used in the calculation of cardiovascular risk score. This is because it does not independently predict cardiovascular risk. [26]

The findings from this study revealed that SBP value was significantly higher in men than in women. This confirmed the work done by some researchers [9, 28, 29]Reports have it that men had a higher risk of dying from cardiovascular causes than women of similar age range. [9] The mechanism underlying the differential age effect is not well understood. [30] The age of both genders was the same in this study. Age is among the important factor in developing cardiovascular disease as one aged. [31] It is associated with loss of arterial elasticity and reduced arterial compliance which may lead to coronary artery disease. [3]

In this study, the Framingham cardiovascular risk score was significantly higher in male subjects than in female subjects after the computation of risk factors obtained in the study. Ezeanyika *et al*,[9] reported that men are likely to die of cardiovascular event compared to females of similar age range with high blood pressure in the next five years using a risk score calculator.

5. CONCLUSION

The study revealed that male diabetics may be more prone to cardiovascular events than none diabetics due to higher increase in cardiovascular risk factors such as increase in percentage Framingham risk score, age, SBP, LDL and triglycerides. Therefore, it is needful for individuals as they are ageing gracefully should modify lifestyles and habits that may predispose them to cardiovascular disease and improve longevity with quality of life.

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