ASSESSMENT OF CARDIOVASCULAR RISK FACTORS AMONG QUARRY WORKERS IN OGUN STATE

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ABSTRACT

This research assessed the cardiovascular risk factor among quarry workers in Ogun state. One hundred copies of questionnaires was used to obtained information on cardiovascular risk factor which include smoking, sedentary lifestyle, age, stress inflammation and pain, cardiovascular history, environment. Participant's blood pressure was obtained in sitting observing standard precautions. Weight, height, body mass index (BMI) and Blood Test determined. Data were analysed using statistical package for social science version 17 (SPSS). It is estimated that 41% of respondents live beside the main road and in an industrial area with gas emissions. Participants were mostly in the low and moderate risk categorised with only few of the participants in high level of cardiovascular risk. There was significant difference in age, weight and BMI of participants ($P < 0.05$).

Keywords: Cardiovascular Risk, Querry Workers, Participants Blood Pressure.

INTRODUCTION

Cardiovascular disease (CVD) is a general term that describes a disease of the heart or blood vessels. Blood flows to the heart, brain or body can reduced as the result of a blood clot or by a build up of fatty deposits inside an artery that cause the artery to harden and narrow. It also refers to conditions that involve narrowed or blocked blood vessels that can lead to a heart muscle, valves or rhythm, also are considered forms of heart disease. Cardiovascular disease remains a leading cause of death worldwide, a fact that underscores the importance of primary prevention. Effective prevention relies on the accurate identification of individuals at risk of developing heart disease. Traditional risk factor including age, gender, hypertension, dyslipidemia, smoking and diabetes are from the foundation for all cardiovascular risk prediction models. (Jones et al., 2006).

Although both risks factors and risk markers can convey important information, it is necessary to understand which one we are dealing with because it determines the criteria by which we should judge the clinical utility risk factors that constitute viable targets for therapy, such as LDL cholesterol, warrant routine clinical measurement. He would expect the level of the risk factor to be statistically associated with clinical outcomes, as evidenced by an elevated odds ratio or relative risk (Gona et al.., 2006). Traditionally, coronary predominantly affecting men for a long time, women were not concluded in cardiovascular research programs. Women were less likely to be referred for diagnostic and therapeutic procedure for coronary heart disease (Toben, 1987).

Another effect of cardiovascular disease, epidemic is loss of man-power due to earlier onset of disease (by an average of 10years). In fact, in developing countries (i.e. Indian) more than 50% of cardiovascular death occurred before 70years of age as compared to less than 25% of cardiovascular death in developed countries (Reddy et al.., 1998). The majority of cardiovascular disease is caused by risk factors that can be controlled, treated or modified such as high blood pressure, cholesterol, obesity, lack of physical activity and diabetes (Mendis et al.., 2011).

Cardiovascular disease caused by unhealthy rise in blood pressure. People who work at the quarry site, subject themselves to such a vigorous work, staying late at work with little or no time to rest. Exposing the entire body to a vigorous work may tend to contribute to high blood pressure and other health issue in the body. The environment where these workers worked is not conducive enough to support the health conditions. The dusts included in the site are factors contributing to cardiovascular disease but this research work will provide first-hand information about the effect of the quarry work as a risk factor for cardiovascular disease.

Cardiovascular disease is one of the leading causes of mortality and is responsible for one-third of the global death. It is a major cause of death developing countries accounting for about 8 million deaths compared to about 5.3 million in developed countries. Cardiovascular disease occurs as a result of life style adopted, the nature of their work and the kind of activities they engaged in, all these factors contributed to cardiovascular risk factors. The study aims to determine the risk factors of cardiovascular disease of quarry workers in Ogun State.

METHODOLOGY

Study Area and Background Information

Abeokuta is the biggest city and the state capital of Ogun State in Southwest Nigeria. It is situated on the east bank of the Ogun River near a group of rocky in a wooded savannah 77 kilometres (48m) north of Lagos by roadway, or 130 kilometres (30m) water. As of 2005, Abeokuta and the surrounding area had a population of 593, 140. It has below the Olumo rock, home to several caves and shrines. They depend on the Oyan River Dam for its water supply, which is not always dependable (Hiberg et al.., 2010).

Abeokuta North is a local Government Area in Ogun State, Nigeria. Its headquarters are in the town of Akonja, near Abeokuta. It has an area of 808km^2 and a population of 201, 329 at 2006 census.

Sample Size

The targeted size for this study comprises of one hundred quarry workers, both male and female in Abeokuta South Local Government due to the relevant data that was collected from them.

Sample Procedure

The researchers adopt purposive sampling procedure in selecting respondent from the targeted size in order to reduce sampling error.

METHOD OF DATA COLLECTION

The data was collected with the use of a well-structured and protested questionnaire for the survey.

- The first section of the questionnaire contains the personal data and the Anthropometric measurement of the respondent
- The second section of the questionnaire contains the lifestyle.
- The third section of the questionnaire contains the environment and cardiovascular history
- The fourth section of the questionnaire contain bowel toxicity
- The sixth section of the questionnaire contains the inflammatory and pain and dietary intake.

Anthropometric Indices

The anthropometric indices measured were weight, height, B.M.I, lipid (blood) test and blood pressure. The materials used for this research project include:

- Bathroom Scale
- Heightometer
- Sphygmomanometer

- Lipid profile

Bathroom Scale

A digital bathroom scale is a type of electronic weighing machine, which is used to measure many readings including body fat, BMI, lean mass, muscle mass, water ratio along with body weight. The digital bathroom scale is a smart scale which has many functions like smart scale integration, cloud storage, fitness tracking, etc. The respondent was allowed to step by making onto the measurement platform by making sure that subject are standing with the weight (Petruso et al.., 1981).

Sphygmomanometer

Sphygmomanometer is a device used to measure blood pressure, composed of an inflatable cuff to collapse and then release to as a sphygmomanometer, release the artery under the cuff in a controlled manner and a mercury or mechanical manometer to measure the pressure. It is always used with the conjunction with a means to determine at what pressure blood flow is just starting and at what pressure it is unimpeded. Manual sphygmomanometers are used in conjunction with a stethoscope (Booth, J 1977).

Lipid Profile

Lipid profile or Lipid panel is a panel of blood tests that serves as an initial broad medical screening tool for abnormalities in lipids, such as cholesterol and triglycerides. The results of this test can identify certain forms of pancreatitis and other diseases. Lipid panels are commonly ordered as part of a physical exam, along with other panels such as the complete blood count (CBC) and Basic Metabolic Panel (BMP).

Body Mass Index (BMI)

Body mass index is the measure of body fat based on height and weight. It is an international used index to show the body condition by checking the balance between the heights and is universally expressed in units of kg/m^2 resulting from mass in kilograms and height in meters, body mass index is used to know whether the person is normal or overweight, underweight or obese etc. It is expressed by:

$$BMI = \frac{Weight\ (kg)}{Height\ (m2)}$$

Underweight = Less than 18.5
Normal weight = 18.5 – 24.9
Overweight = 25 – 29.9
Obesity = 30 or greater (BMI classification 2006).

Heightometer

This is an electronic device that measures how tall a subject. This is used in measuring the height of a person. The height of each participant was measured in meter. The subjects stood bear-footed as upright as possible on a hard level ground against a vertical wall and without raising their heel were aligned with a ruler bar against the vertical surface. Measurement was made by moving a sliding head piece to the vortex of the subject head and the reading at that point was record (Charlie, 2014).

Ethical Consent

A written informed consent was obtained from each participant after benefit has been explained to the participant.

Blood Sample Collection

The blood sample was collected by an expert medical laboratory scientist into a 10ml EDTA bottles, it was confirmed using bench top centrifuge at 3,000 revolution min for 5 minutes. The plasma was separated into a clean plain bottle. This was tightly capped and stored in the freezer at $20^{\circ}C$ until analysed for Total Cholesterol, Triglycerides, High Density Lipoprotein Cholesterol, Low Density Lipoprotein Cholesterol, Apo lipoprotein A Level and Apo lipoprotein B Level.

Estimation of Total Cholesterol

Method: Enzymatic

Principle: Cholesterol was determined by enzymatic hydrolysis and oxidation. The indicator questionnaire was formed from hydrogen peroxide and 4-aminoantipyrine in the presence of phenol and proxidase. The absorbance of which was determined at 500mm in UV spectrometer (Alain et al.., 1974).

Estimation of Triglyceride

Method: Enzymatic

Principle: Triglyceride was determined by enzymatic hydrolysis with lipases. The indicator quinoneimine was formed from hydrogen peroxidises. The absorbance of which was determined at 500mm in UV spectrophotometer.

Estimation of the High Density Lipoprotein Cholesterol

Method of Precipitation:

Principle: LDCL and VLDLC were precipitated out quantitatively by the addition of phosphotunsticacid in the presence of magnesium ions. After centrifugation,

the cholesterol concentration in the HDL fraction (supernatant) was determined in the cholesterol estimation.

Calculation of Low Density Lipoprotein Cholesterol:
LDL cholesterol was calculated using formula
LDLC = TC – (TG/5) / HDLC
Where TC is total cholesterol, TG is triglyceride; HDLC is High Density Lipoprotein Cholesterol (Trander, 1969.

RESULT

Table 1: THE TABLE SHOWS THE PERSONAL DATA

Variables	Frequency	Percentage
Sex		
Male	75	75%
Female	25	25%
Age		
21 – 35	76	76%
36 – 50	24	24%
Religion		
Christianity	80	80%
Muslim	20	20%
Ethnic group		
Yoruba	54	54%
Igbo	46	45%
Marital status		
Married	63	63%
Single	37	37%
Level of education		
Primary	50	50%
Secondary	41	41%
Tertiary	9	9%

Table 2: THE TABLE SHOWS THE LIFESTYLE

Variable	Frequency	Percentage
Main road		
Yes	41	41%
No	59	59%
Type of toilet		
Pit latrine	63	63%
Short put	1	1%
Water closet	36	36%
Alcohol		
Yes	46	46%
No	54	54%
How often		
Weekly	67	67%
Occasionally	33	33%
Tobacco		
Yes	36	36%
No	64	64%
Smoking		
Yes	51	51%
No	49	49%
How often		
Daily	44	44%
Occasionally	56	56%

Table 3: CARDIOVASCULAR HISTORY

Variables	Frequency	Percentage
Cardiovascular disease		
Yes	41	41%
No	59	59%
Tiredness or weakness		
Yes	51	51%
No	49	49%
High blood pressure		
Yes	56	56%
No	44	44%
Headache		
Yes	50	50%
No	50	50%
Bypass surgery		
Yes	22	22%
No	78	78%
Heat surgery		
Yes	35	35%
No	65	65%

Only 12 Respondents was Assess to Analyze Lipid Test

CODE	TOT. CHOL	HDL	LDL	TG
ABE	167	48	82	137
BOD	183	52	116	83
DEJ	158	40	107	96
IJK	158	52	106	87
ACD	152	44	94	78
GJI	138	36	92	102
NYK	140	44	100	94
LEY	158	39	90	124
PSP	168	38	110	83
NEL	140	51	88	101
EFG	128	53	88	134
HON	138	38	98	102

Table 7 shows the reference range of lipid profile

Total cholesterol (95 – 200)
HDL   (30 – 60)
LDL   (70 – 160)
T.G   (70 – 200)
The lipid (blood test) profile of the respondent is normal. The measurement for lipid is mg/dl.

DISCUSSION, CONCLUSION AND RECOMMENDATION
Discussion
This study was carried out to assess the cardiovascular risk factors among quarry workers in Ogun State. Assessing the risk for presence of major cardiovascular disease risk factors among quarry workers is of particular importance since it enables us to promptly identify persons at high risk for development of clinical cardiovascular disease and implement prevention. It was observed that male participants were bigger, taller and older than their female, although the measure of adiposity as measured by BMI was higher for female participants. Certain authors have reported on the physical characteristics of males and females similar to that observe in this study (Ayanniyi et al.., 2008).

The BMI of respondent calculated shows that 44% have normal weight, 45% were overweight while 11% had obesity grade 1. The respondents having normal weight take right amount of food and balance their food intake with their strenuous work. The reason for the percentage overweight and obese individuals is due to excessive calories and fat consumption by the respondents. This is a risk factor to certain disease like diabetes, hypertension and stroke which is likely to contribute to the health conditions. The weight of the respondents needs to be controlled by eating healthy foods.

The results also shows that 78% fall between the ages of 21 – 35 while 24% falls between the ages of 38 – 50 years of the respondents are male while 25% are female. Majority of them were Yoruba, live in one room apartment and use pit latrine, public bathroom and kitchen. 50% had primary education, 41% stopped at secondary school while 9% finished tertiary level. The lipid (blood test) level shows that all the selected respondents were normal which indicates that they are not hyperlipidemic. Hyperlipidemic refers to high cholesterol or abnormal high lipid level.

Majority of the respondent skipped breakfast some skipped breakfast in order to leave for work early while others are not used to breakfast meals. Some of

the respondents complained that beans causes constipation after eating, some of the respondent complained that eating vegetables causes stooling. 46% of the respondents take alcohol while 54% do not take alcohol, 67% consume alcohol weekly while other 33% consumed alcohol occasionally. Those that consume weekly are prone to cardiovascular risk factor than those that consume occasionally especially when it is consumed in excess. 51% of respondents have smoking habit while 49% do not, 44% of the respondents smoke on daily basis while 56% do smoke occasionally. Those that smoke daily are prone to cardiovascular risk factors and are prone to have respiratory diseases.

CONCLUSION

After assessing the cardiovascular risk factors of the quarry workers in Abeokuta, it was concluded that:

- The body mass index show that anthropometric indices for most of them were good, however, the respondents that were underweight needs to be eat and live healthy so as to be on normal weight and those that already have normal weight should eat healthy food as to maintain their weight.
- The lipid level test of the quarry workers is good according to the lipid test.
- Their dietary intake was poor since most of them skip meal and majority do not consume in between meals and fruits and vegetable regularly. Although, their consumption of carbohydrate food is normal since they require high energy due to their strenuous work activity.

RECOMMENDATION

The recommendations are as follows:

- This study can be maintained through proper awareness and public enlightenment
- Government should not allow residence beside the main road in an industrial area with gas emissions
- There should be a restriction of smoking cigarette, alcohol and tobacco
- Quarry workers should be put on safe guard in order to prevent themselves from injury e.g. Helmet to prevent them from falling of materials, nose cover to prevent inflammation and dust, boot to prevent stepping on stones and hot ground, gloves to prevent them from cuts
- People fumigating should use nose cover in order not to inhale chemicals like insecticides, pesticides e.t.c.

REFERENCES

Booth, J. (1977). "A short History of Blood Pressure Measurement". Processing of the Royal Society of Medicine 70(ii): 793 – 9. PMC 1543468. PMID 3411 – 69. Retrieved 2009-10-06.

BMI Classification" Global Diabetes on Body Mass Index. WHO (2012). Retrieved July 27, 2012.

CDC, NCHS: Body Measurements (BMX_D). (2007). http://www.edu.gov/nchs/nhanes2005-2006/BMX D.htm

Choussat R., Thomas D., Collect J. P., Montalescot G, (1998) Risk Factor for Coronary Heart Diseases. Eur Heart J. (1998; 19(Suppl H): H-11-H-17

Global Atlas on Cardiovascular Disease Prevention and Control Mendis S., Puska P., Nomving B. Editors. World Health Organization in Collaboration with the World Heart Federation and World Stroke Org, Geneva 2011

Hjplstadl. Arnesen E. Lund – Larden P. G. Smoking, Serum Lipids, Blood Pressure and Sex Differences in Myo cardial infarctiuon A. 12 years Follow-Up of the Film Mark Study Circulation (1996:93:450-456).

Jousilahti P., V. Atianinen E. Tuomi Lento J. Puska P. (1999) Sex, Age, Cardiovascular Risk Factors and Coronary Heart Disease: A Prospective Follow-up Study of 14 786 Middle-Aged Men and Women in Finland. Circulation (1999:99:1165-1172).

Knaw K. I. Epidemiology of Coronary Heart Disease in Women. In Julian D. G., Wenger N. K., Editors, Women and Heart Disease, St. Louls, M. O., Mobsy (1997, Pp 7-20)

National Cholesterol Education Program (NCEP) Expert Panel on Detection, E. (2002).

Petruso Kari M. (1981), "Early Weights and Weighing in Egypt and the Indus Valley", M. Bulletin" 79 Boston Museum of Fine Arts. PP, 44-51, Retrieved 2014-02-26

Reddy R. S., Yusuf S. (1998). Emerging Epidemic of Cardiovascular Disease in Developing Countries Circulation (99):596-601.

Sowers J. R., Epstein in, Frohich E. D. (2001). Diabetes, Hypertension and Cardiovascular Disease. Hypertension and Cardiovascular Disease. Hypertension 37:1053-1059

What is Cardiovascular Disease? American Heart Association hhp//www.heart.org/caregiver/resources/accessed may 11, 2014.