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ISSN 2348-0416
USA CODEN: JASRHB

Journal of Applied Science And Research, 2014, 2 (2):124-128

(*http://www.scientiaresearchlibrary.com/arhcive.php*)

Effects of Age and Gender on Plasma Total Cholesterol and LDL-cholesterol among Elderly Sudanese in Khartoum State, Sudan

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ABSTRACT

Hyperlipidemia is a common risk factor for atherosclerosis, ischemic heart disease and stroke especially in the elderly. The Objective of this study is to assess the Effects of Age and Gender on Plasma Total Cholesterol and LDL-cholesterol among Elderly Sudanese in Khartoum State. A community-based and case-control study was conducted in Khartoum State, Sudan, during the period from June to December 2011. A total of 70 healthy elderly Sudanese (35 males and 35 females) as a test group (age range 50-80 years) and 70 healthy adults (35 males and 35 femals) as a control group for comparison (age range 20-50 years) were enrolled in this study .Diabetic and hypertensive subjects were excluded from this study. The plasma levels of total Cholesterol and LDL-Cholesterol were measured using reagents and a spectrophotometer from Bio-system Company. SPSS program was used for analysis of data. The plasma levels of total cholesterol and LDL –cholesterol were significantly raised in the test group when compared with the control group (P-value <0.05).There was no significant difference between the means of the plasma levels of total cholesterol and LDL-cholesterol of males when compared to female among the test group (P-value >0.05).In conclusion, elderly Sudanese of both sexes , are at a higher risk of atherosclerosis, ischemic heart disease and stroke as a consequence of significantly raised total cholesterol and LDL-Cholesterol. Gender showed no effect on the plasma levels oftotal cholesterol and LDL-Cholesterol among the elderly Sudanese.

Keywords: Total Cholesterol, LDL-Cholesterol, Elderly People

INTRODUCTION

The elderly is a group that is more exposed and is vulnerable to health problems. They require special attention and care and they have different anatomical and physiological changes that occur with increasing age (1). These changes often lead to health problems and even death(2). In order to ensure health and well-being of this growing age group it is important that; health care, professionals, the government, the community, their families and the elderly themselves shouldunderstand the physiological changes that are happening(3). Atherosclerosis and age are closely linked, and atherosclerosis is the best example of age-related disease[3]. With advancing age atherosclerosis becomes progressively more prevalent and more severe and is universally present in older humans. Thus controlling the factors that cause atherosclerosis would make a major impact on the health of older people (3,4). The role of serum lipids, lipoproteins, and Apo lipoproteins in the development of atherosclerosis and consequently in the development of coronary and cerebrovascular diseases has been reported in many countries(5).
It has also been shown that there is a strong positive association between the serum cholesterol levels of different national groups and their ischemic heart disease mortality rates (6,7). According to our knowledge no similar study was done to assess plasma total Cholesterol in elderly Sudanese population.

MATERAILS &METHODES:

An analytical, community-based and case-control study was conducted in Khartoum state, Sudan, during the period from June to December 2011. A total of 70 elderly Sudanese (35males and 35 females) with age range 50-80 years, as a test group and 50 healthy adults as a control group with age range 20-49 years, were enrolled in this study. Personal and clinical data for each participant was recorded in a questionnaire sheet. A fasting venous blood sample (5 ml) was collected from each participant in lithium heparin to obtain plasma. The plasma concentrations of total Cholesterol and LDL-Cholesterol were measured using fully automated Roche diagnostics /Hitachi 902 and reagents from Bio-System Company. Those with Diabetes, Hypothyroidism, Nephrotic Syndrome and Obstructive Biliary disease were excluded from this study. The objectives of the study were explained to each participant and a written consent was obtained. The test group and the control group were matched for gender. SPSS (Version 14.0) was usedfor analysis of data. The mean and the standard deviation for each variable were obtained. t -test was used for comparison between the means of variables of the test group and the control group. P-value $\leq$ 0.05 was considered significant.

RESULT AND DISCUSSION

In this study, the test group included 70 Sudanese patients with Type 2 Diabetes (50% males and 50 % females) and 50 healthy subjects (50% males and 50%femals) as a control group. There was a significant difference in age, between the test group and the control group (Mean±S.D:64.46±8.56 vs 36.94±8.21, respectively, P= 0.0).
Table 1: Shows a significant increase of the mean of the plasma levels of total cholesterol of the test group when compared to the control group (P<0.05).
Table 2: Shows a significant increase of the mean of the plasma levels of LDL-Cholesterol of the test group when compared to the control group (P<0.05).

Table 3: Shows no significant difference between the means of the plasma levels of total cholesterol and LDL-Cholesterol of males when compared to females among the test group (P<0.05).

Table.1: The means of the plasma levels of total cholesterol of the test group and the control group.

	Group	Mean	Std. Deviation	P-value
Plasma total cholesterol	Test	183.32	53.73	0.00
	Control	143.87	29.97	

. **Table 2: The means of the plasma levels of LDL-cholesterol of the test group and the control group.**

	Group	Mean	Std. Deviation	P-value
Plasma .LDL	Test	110.26	46.15	0.00
	Control	66.6	18.47	

Table 3: The means of plasma total cholesterol and LDL-cholesterol of males and females among the test group.

variable	Gender	Mean	St. Deviation	P-value
T. Cholesterol	Male	178.37	55.76	0.54
	Female	187.89	52.49	

LDL- c	Male	108.50	45.57	0.79
	Female	111.89	47.51	

The present study showed significant increase in the means of the plasma levels of total cholesterol and also of LDL-cholesterol of the test group when compared with the control group ($P<0.05$).The reason for this could be due to inactivity which is common in the elderly, and also to increase intake of food especially those foods with high contents of carbohydrates and lipids. The results of the current study agree with that ofLewington (4) andKeys(5)who reported significant elevation of the plasma levels of total cholesterol and LDL-cholesterol in the elderly compared to young adults. In a study done by Okęcka-Szymańska et al(8), they reported that, the age-dependent worsening of lipid profiles increase the risk of cardiovascular diseases in sedentary elderly subjects, and on the other hand, the beneficial effects of motor activities on lipid profile observed in elderly women evidence the indispensability recommending of physical exercises to the elderly.

There are many biochemical and physiological changes associated with aging process including decrease in total body water, muscle mass, increase bone density with remodeling (and decrease mass with osteoporosis); an increase in lipids (total cholesterol, LDL-cholesterol and triglycerides); and gradually decline in respiratory, cardiovascular, kidney, liver, immune, neurologic, and endocrine system functions; that due to many factors including heredity, lifestyle, and nutrition (9). In a study done by Bermudez et al (10), they suggest that lifestyle changes, including diet modification and exercise, could be of significant benefit to the elderly .

The results of the present study showed no effect of gender on the plasma levels of total cholesterol and LDL-cholesterol of males when compared with that of females among the test group ($P>0.05$). In both men and women in the test group, the plasma levels of total cholesterol and LDL-cholesterol were significantly raised when compared with healthy controls. Cardiovascular disease continues to be an important cause of death in old age in both men and women (11). Atherosclerosis is the major cause of death in the United States, it's a progressive disease process that begin early in life, involves vascular alteration characterized by fatty accumulation in the vascular walls which may lead to coronary heart disease (12). In a study done by Tietz and colleagues on fit elderly subjects, total cholesterol, HDL cholesterol, and triglycerides were found to be increased as a part of aging process(6). HDL-cholesterol or good cholesterol, however, is considered as an important inverse risk factor for coronary heart disease, with values less than 35 mg/dl indicate a high risk and values more than 35 mg/dl indicate a low risk(6,13).

CONCLUSION

This study showed significant increase in the plasma levels of total cholesterol and also of LDL-cholesterol among elderly Sudanese subjects, hence, they are at a higher risk for atherosclerosis and its consequences. Inelderly Sudanese,the plasma levels of total cholesterol and LDL-cholesterol are not affected by gender.

REFERENCES

[1]. International Dictionary of Medicine and Biology, **1986**.

[2]. Ebersole P, Hess P. Toward Healthy Aging: Human Needs and Nursing Response, Mosby, St. Louis, MO **1998**.
[3]. Kuller L H, Orchard T J. The epidemiology of atherosclerosis in 1987: Unraveling a common-source epidemic. ClinChem **1988**;34:40-48.
[4]. Lewington S, Whitlock G, Clarke R, Sherliker P, Emberson J, Halsey J, Qizilbash N, Peto R, Collins R). "Blood cholesterol and vascular mortality by age, sex, and blood pressure: a meta-analysis of individual data from 61 prospective studies with 55,000 vasculardeaths". Lancet. **2007**; 370 (9602): 1829–39 .
[5]. Keys A. Coronary heart disease in seven countries. Circulation **1970**;(41):l-4)1
[6]. Tietz NW, Shuey DF, Wekstein DR. Laboratory values in fit aging individuals.INFaulkner WR, Meites S, eds. Geriatric Clinical Chemistry: Reference Values. Washington, DC: AACC press, **1994**: 145-184.
[7]. Cheng.k, Chen.y and Lai.S.(2011).Prevalence of dyslipidemia in patients receiving health checkup: Hospital- based study. Cholesterol **2011**:45-49.
[8]. Okęcka-SzymańskaJ ,Hübner-Woźniak E , Piątkowska I ,Malara M. Effects of age, gender and physical activity on plasma lipid profile.Biomedical Human Kinetics.**2011**; 3: 1–5.
[9]. Liew CC. Biochemistry aspects of aging. In: Gornall AG, ed. Applied Biochemistry of Clinical Disorders, 2nd ed. Philadelphia: Lippincott-Raven, **1986**:558-565.
[10]. Bermudez OI, Velez-Carrasco W, Schaefer EJ, and Tucker KL.Dietary and plasma lipid, lipoprotein, and Apo lipoprotein profiles among elderly Hispanics and non Hispanics and their associationwith diabetes. Am J Clin **Nutr2002**;76:1214–21.
[11]. Knight JA. Laboratory Medicine and Aging Process. Chicago, IL: American Society of Clinical Pathologists,**1996**.
[12]. Stout R W .Ageing and atherosclerosis. Age Ageing. **1987**; 16(2):65-27
[13]. Bishop M L,Duben-Engelkirk,FodyEp. Clinical chemistry .principle, procedure, correlation 4th ed .Lippincott wiliams&Wikins.London **2000**:220-231.