A comparative study of the level of lipid parameter between construction worker and office employees

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دراسة مقارنة لمستوى ألدهون في الدم بين عمال البناء وموظفو المكاتب

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المستخلص

أجريت الدراسة على مجموعتين مكونة من 300شخص من الذكور تتراوح أعمارهم بين 31-41 عاما. المجموعة الاولى (150) يعملون في الأعمال الإنشائية التي تتطلب بذل نشاط بدني ومقارنة ذلك مع المجموعة الثانية(150) ممن يعملون في الوظائف المكتبية حيث لا يتطلب عملهم بذل جهد عضلي.

أظهرت الدراسة أن نسبة كولسترول الدم الكلي , الكولسترول ذو البروتين ألدهني منخفض الكثافة , الدهون الثلاثية ومؤشر كتلة الجسم منخفض لدى الأشخاص الذين يعملون في الأعمال الإنشائية مقارنة مع الأشخاص الذين يعملون في المكاتب. ، ووجدت الدراسة أن مستوى الكولسترول ذو البروتين ألدهني عالي الكثافة لدى العاملين في الأعمال التي تتطلب جهد عضلي أعلى مما هو عليه لدى الأشخاص الذين يعملون في المكاتب

الدراسة استنتجت بان مستوى دهون الدم يختلف بين عمال البناء وموظفو المكاتب

Abstract

The study was conducted on two group of 300 adults males their aged between 31-41 years, group one (150) are construction worker that require physical activity compared with group two(150) who are office employee where there work does not require physical activity.

The study showed that the level of total cholesterol (TC) , low-density lipoprotein cholesterol (LDL-c),Triglyceride(TG) and body mass index (BMI) is low among persons who work in construction works as comparison with persons who work in office. The study explored that the level of high-density lipoprotein cholesterol (HDL-c) among people male who work in construction works higher than it is in people who work in offices ($p<0.001$). From the study, it appears that the response of lipid parameter levels will differ between the construction worker and office employee.

Introduction

Lipids and lipoproteins are essential constituents of the body, and their activities assist in maintenance of the body homeostasis. The important factors that have to be considered during an exercise are its intensity and duration which has to be determined to produce major health benefits. Low intensity exercise done for longer periods uses fat as the substrate for energy, whereas high intensity exercise uses carbohydrate rather than fat. This finding has led to the recommendation that traditional low to moderate intensity exercise is beneficial to produce changes in lipid parameters

compared to high intensity exercise as observed by few studies (1-3). Cholesterol is major plasma lipid include low-density lipoprotein [LDL] cholesterol, which called bad cholesterol because can build up on the inside of artery walls, contributing to artery blockages that can lead to heart attacks. Higher LDL cholesterol levels means higher risk and high-density lipoprotein [HDL] cholesterol is known as "good" cholesterol because it helps prevent arteries from becoming clogged. Higher HDL cholesterol levels generally mean lower risk (4). Hyperlipidemia is defined as an increase in the fasting serum cholesterol or triglyceride levels or both. Physical inactivity is related to decrease high density lipoprotein cholesterol [HDL-C] and exceeded triglycerides [TG] concentrations, which contribute at least partially to increased atherosclerotic diseases risk (5).A sedentary lifestyle is a state of inactivity as it leads to major health problems like obesity, hypertension and various metabolic disorders. A sedentary lifestyle is characterized by sitting most of the day in an office or at home (6). Sedentary work refers to that type of work that involves sitting or spending most of the working hours in an office. It is believed to be a factor in obesity and other disorders (7). Exercise is recommended as a therapeutic lifestyle change as it leads to various health benefits. On the other hand, chronic exercise training has favorable effects on lipid profile. In this context, increased exercise practice mainly continuous aerobic exercise has been considered one of the best non-pharmacological strategies in preventing and treating cardiovascular diseases (8). The effective exercise training in lipid profile is depending of exercise intensity and duration and frequency of each session associated with the length of the exercise training period (9). A physically active lifestyle benefits your heart in several ways. It increases your heart's ability to pump blood, promotes weight loss and can help protect against high blood pressure and diabetes. In addition, regular exercise lowers triglyceride levels while increasing levels of "good" HDL cholesterol. Lipid levels may be affected by diet, exercise, smoking and certain medications etc. (10). People who are making an effort muscle regularly in their daily business have more physical activity than their business do not require muscular effort, this activity leads to increase muscle blood flow and leads to positively alter cholesterol metabolism . Physical activity is involved in increasing the production and action of several enzymes that function to enhance the reverse cholesterol transport system (11).The aim of the study to comparative of the Level of Lipid Parameter between Construction Worker and Office Employee

Subject and methods

The study was conducted in the department of medical laboratories of Al-Kut technical institution, Kut/ city Iraq during the year 2014. Plasma lipids concentrations were obtained from 150 adults male who and construction worker and 150 adult male who are office employee after a 12 hour overnight

fasting period they are continue in their job at least one year ago. All the subjects who were excluded from the study those with history of diabetes mellitus, high blood pressure, coronary heart disease, obesity, smokers and any lipid suppressing drugs their ages between 31-41 years. The total cholesterol [TC] and triglyceride [TG] concentrations were determined by standard enzymatic methods (12), High density lipoprotein [HDL] concentrations by selective precipitation with dextran-magnesium chloride (13) by use Apel spectrophotometer. LDL and VLDL concentrations by the Freidewald formula: LDL = TC − [HDL + (TG/2.19)](14). Standard statistical methods (Mean and Standard Deviation) were used for the direct measures and calculated parameters. A 5% probability level was determined as statistical significance of differences calculated for each parameter.

Results

The results [mean±SD] in mmol/L were obtained from the study are shown in the table (1)which showed total cholesterol [TC], low-density lipoprotein cholesterol [LDL-C], very low-density lipoprotein cholesterol [VLDL-C] and triglyceride [TG] were significantly higher in males who work in office and lower in males who work in construction works ,while high-density lipoprotein cholesterol [HDL-C]concentration was significantly higher in males who work in construction works and lower in males who work in office.

Table (1): Lipids level and physical activity status

Treatments*	Staff office	Construction worker
Body mass index kg/m	28 ± 3	25 ± 2.5
Age, years	35 ± 5	36 ± 5
Total cholesterol mmol/L	5.15± 0.98	4.1±0.67
High –density lipoprotein (HDL) mmol/L	1.1± 0.21	1.5± 0.24
low –density lipoprotein (LDL) mmol/L	3.23± 0.39	2.19± 0.16
Very low –density lipoprotein (VLDL)mmol/L	0.82± 0.38	0.41± 0.27
Triglyceride mmol/L	1.8± 0.85	0.9± 0.6

*Each treatment average of 150 male.

Discussion

The parameters of blood lipid profile show that there was significant difference between construction workers and offices employee where their work does not require muscular effort in relation to total cholesterol, high density lipoprotein, low density lipoprotein and triglycerides.

The possible reason for the reduction in total cholesterol and LDL-C; and elevation HDL-C and decrease body mass index was continuous aerobic working muscle of construction business male that increases metabolism and utilization of blood lipids and lipoprotein for energy production (15, 16) Serum triglycerides are lowered by the increase lipolytic activity and the production of high density lipoprotein particles [HDL] is increase (17). The reductions in plasma triglycerides are often observed after make muscular effort requiring energy expenditure similar to those characterized by increased HDL-C (18). The Study confirms the benefits of physical activity on HDL and triglycerides seen in previous research. The Study also found an additional benefit of activity on

reducing LDL. Data from large prospective studies suggest that each 1 mg/dl increase in HDL is associated with significant reductions in risk of coronary heart disease of at least 2% in men (19), and there is substantial evidence that moderate levels of physical activity confer significant health benefits (20).

Conclusions

The study showed that continuous aerobic working muscle associated with increases in HDL-C level which cause decrease in total cholesterol level. However, the response of lipid profile levels will differ between the construction worker and office employee

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