Research Article

Biological Sciences

Measurement of Lipid Profiles in Patients with Acute Myocardial Infarction in Different Anti-Coagulants

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ABSTRACT

Background: Myocardial infraction is the death of heart muscle from the sudden blockage of coronary arterial vessel by a blood clot. Objectives: The aim of this study was to measure plasma/serum lipid concentrations in patients with Acute Myocardial Infraction (AMI) within one week of onset of symptoms of AMI in different anti-coagulates. Methodology: This study was case-control study, match age and sex, carried out in Alshab Teaching Hospital at Khartoum State in period from March to August 2007. Blood samples were collected in all subject study (patients and controls) and estimated the lipids in serum and plasma by colorimetric methods. Results: The (mean ±SD) serum/plasma cholesterol in patients were (162.43±33.78, 161.33±44.37, 161.10±46.94) and also in control subject were (161.43±42.08, 162.80±38.29, 167.70±4.43) respectively. The (mean ±SD) of serum/plasma triacylglycerol in patients and control were respectively (105.30±52.53, 11.70±49.61, 113.70±55.80) in controls were (112.70±57.17, 110.83±54.17, 105.93±42.25). The (mean ±SD) in serum/plasma high density lipoprotein in patients were (41.93±15.95, 38.10±13.65, 36.83±13.31) in control were (112.70±20.95, 110.83±19.63, 105.93±17.09). The (mean ±SD) in patients of low obesity lipoproteins were (99.73±43.27, 100.57±51.58, 102.63±51.25) and also control were (85.10±38.167, 92.93±22, 102.93±47.95) comparison between WHO recommended anti-coagulant (EDTD, Lithium heparin) LDL levels showed a significant difference (P=0.039) in plasma for lithium heparin as anti-coagulant, but HDL showed statistical difference (P=0.0) in both serum and plasma with EDTA. Conclusion: From this study it could be concluded that it might be better to use serum in the measurement of lipid profile than use anti-coagulant (EDTA and lithium heparin).

KEY WORDS

Lipid profiles, anti-coagulant, lithium heparin.

INTRODUCTION

A dramatic increase in the incidence of myocardial infraction (AMI) has been observed in many countries forming major cause of mortality in the middle aged and elderly [1]. The pathogenesis of AMI is multi-factorial, however, several studies have implicated impaired lipid metabolism as one of the crucial factor's in the development of this disease [2]. Kumar *et al.* observed significantly higher total cholesterol and triglyceride concentrations and lower HDL concentrations in AMI patients, LDL concentrations and the ratio LDL to HDL were not significantly different among the two groups; however, serum HDL concentration were significantly deceased in AMI group [3]. The risk of AMI was associated with an increase in LDL and a decrease in HDL, in both Asians and non Asians [4]. Lower levels of serum HDL and higher serum TG were found to be independent risk

factors, while serum LDL was not associated with AMI [5]. Woo *et al.* [6] observed higher mean TC, LDL and TG as well as lower mean HDL in AMI patients,; high HDL was among the protection factors. The presence of hyper lipidemia is usually not assessed during the acute phase of myocardial infraction because plasma lipids undergo several basic changes after myocardial infraction and hence may not reflect the patients basal lipid state [7, 8]. Consequently the standard recommendation is that lipids be assessed 2-3 months after the acute episode myocardial infractions [8].

MATERIAL AND METHODS

Case-control study in patients associated with AMI and subject health. This study was done at Alshab Teaching Hospital at Khartoum State, the period of study from March to August 2007. The age ranged between 45-88 years. This study setting in Khartoum University, Faculty of Medical Laboratory Sciences.

Subjects:

The study was done on convenient specimens including individuals not known to have AMI or history of the disease as control group. Patients complaining from AMI within one week after onset of symptoms of AMI in Khartoum State but from different tribes. The selected patients diagnosed as having AMI based on ECG, cardiac enzymes and troponin levels as Biomarkers, female patients who are on contraceptive pills or who are pregnant and patients with known past history of AMI as exclusion criteria. 80 age matched male and female were entered into this study, fourty patients and fourty subject health as control group matched for age, sex and presence of diabetes and hypertension.

Sampling:

5ml of venous blood were collected using antiseptic for the skin (70% ethanol). Blood was transferred into two containers 2ml in the EDTA container, 2ml in the lithium heparin container and 1ml was used to obtain serum after blood clotting. Blood was centrifuged from 3-5 min. at 4000 rpm and lipid profiles were estimate by colorimetric methods using commercial kils (Biosystems S. A Costa, Spain).

Statistical analysis:

All of the results were analyzed by statistical analysis using statistical package of Social Science (SPSS) to consider significant.

RESULTS

Table (1): (mean ±SD) of lipid profiles among this study

Parameters	Methods	Cholesterol	Triacylglycerol	HDL	LDL
Patient	EDTA	161.33±46.94	115.70±49.61	38.10±13.65	100.57±51.53
	Heparin	161.10±46.94	113.70±55.80	36.83±13.31	102.63±51.25
	Serum	162.43±42.08	105.30±52.53	41.93±15.95	99.73±43.27
Controls	EDTA	162.80±38.29	110.83±54.17	47.83±19.63	92.93±48.22
	Heparin	167.70±45.43	105.93±42.25	45.03±17.09	102.93±47.95
	Serum	161.43±33.78	112.70±57.17	55.13±20.95	85.10±38.16

LDL showed statistical significant difference (P=0.039), higher for lithium heparin than EDTA, but cholesterol (P=0.44), triacyl glycerol (P=0.404), HDL (P=0.09) showed no significant difference, these comparison between the WHO recommended anti-coagulant EDTA and lithium heparin. HDL showed significant difference (P=0.0) is higher for serum than EDTA, but cholesterol (P=0.0971), LDL (0.224), triacyl glycerol (P=0.245) are not significant differences. These are comparison between WHO recommended anti-coagulant (EDTA and serum.

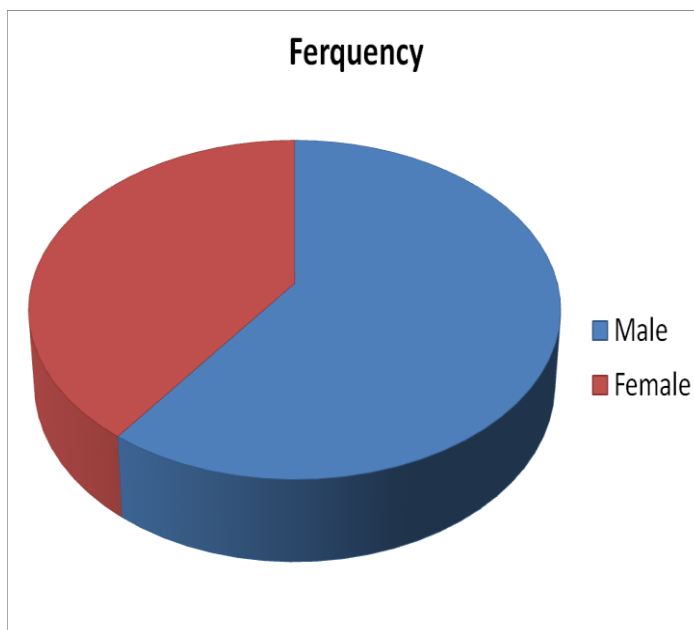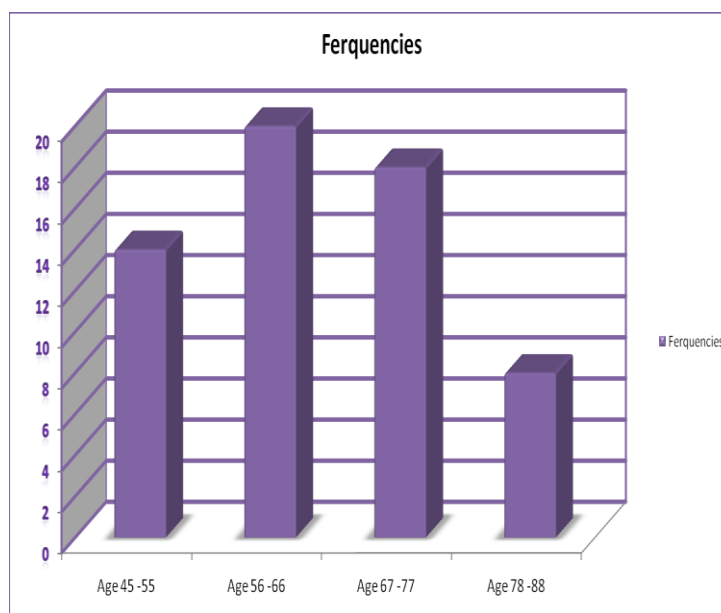**Fig (1): Distribution of males and females among study population**

Fig (2): Age distribution among study population

DISCUSSIONS

Our results showed significant difference of HDL in serum and plasma with EDTA and also showed significant difference of LDL in plasma with lithium heparin. Modawe *et al*. [1] have observed significant difference of serum HDL and TG in AMI Sudanese patients. Rosokija *et al*. [9] have followed up the HDL cholesterol levels in AMI patients from 24 hours to 3 month and concluded the optimal times for determining the HDL concentration are the first 24 hours of the actual event; this is due to the fact that in the first 24 hours there is a relevant decrease of the HDL concentration in the blood. The cause of reduced serum lipids in AMI patients in our study is not clear. It could be related to dietary modifications or due to metabolic change during acute crisis. Nevertheless, the

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lipids data negate the general conception that dietary lipids restrictions may prevent the risk of AMI. High serum levels of HDL are associated with reduced risk for the development of atherosclerotic disease, HDL particles are believed to be anti-atherogenic, secondary to their capacity to drive reverse cholesterol transport and antagonize pathways of the inflammation, thrombosis and oxidation. The majority of patients in both the primary and secondary prevention setting continue to experience significant residual risk for acute cardiovascular events; even LDL is lowered aggressively via combination of lifestyle modification and pharmacological intervention [10]. There is an increase focus on targeting and treating low serum of HDL in an effort to further reduced risk for cardiovascular events, including AM [10].

From this study it could be concluded that it might be better to use serum in the measurement of T. cholesterol, HDL, LDL, and TG than use EDTA and Lithium heparin; both the latter produce a negative bias due to their osmotic effect, leading to shift of water out of the red blood cells, thus diluting the plasma lipoproteins.

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