HYPERLIPIDAEMIA AND ACUTE MYOCARDIAL INFARCTION

Dr . Mohannad Aljashami

ABSTRACT :

Two hundred patients with acute myocardial infarction (AMI) were studied at coronary care unit of Diwanayia Teaching Hospital during the period between October 2004 and 2006. 5c.c. of blood was obtained from each patient with AMI within 8 hours of the event. Lipoprotein estimation was done by enzymatic methods. Low density lipoprotein (LDL) of more than 100-mg/dl is found in 154(77%)patients. While high density lipoprotein (HDL-C) of less than 35mg/dl is found in 56(28%)patients. The total number of smoker patients without hypertension and diabetes is 76 patients , 56 of them have LDL-C more than 100mg/dl, 14 have HDL-C of less than 35mg/dl. The total number of studied diabetic patients is 36, 30 of them have serum triglyceride of less than 200mg/dl. 54 of post menopausal women out of 70 have serum LDL-C of more than 100mg/dl while the two premenopausal patients have no ischemic risk factors.

INTRODUCTION:

The risk factors for myocardial infarction (MI) parallel those for atherosclerosis, the effect of risk factors is multiplicative rather than additive; thus people with a combination of risk factors (e.g. smoking , hypertension, and diabetes) have the greatest risk of developing coronary heart disease. The risk factors are classified into fixed (age , male sex, family history) and modifiable risk factors which included the followings ; smoking , hypertension , lipid disorders , diabetes mellitus , haemostatic variables , sedentary lifestyle , obesity, dietary deficiencies of antioxidant vitamins and polyunsaturated fatty acids.

Patients with familial hyperlipidaemia have a high incidence of premature coronary disease and many epidemiological studies have demonstrated a positive correlation between mean population plasma cholesterol concentration and morbidity and death from coronary heart disease . The excess risk is closely related to the plasma concentration of LDL cholesterol and inversely related to the plasma HDL-C concentration. There is also a weak correlation between plasma triglyceride concentration and the incidence of coronary artery disease . Extensive large –scale randomized trials have shown that lowering total LDL and cholesterol concentration reduces the risk of cardiovascular events including death, myocardial infarction and stroke , and also reduces the need for revascularization .. Almost halve of all patients with coronary heart disease have low concentration of HDL, which is the commonest lipoprotein abnormality. The atheroprotective function of HDL was first highlighted almost 30 year ago, and stimulated many genetic factors (e.g. sex , diabetes , genes encoding lipoprotein related products studies into including the main HDL apolipoprotein(apoAI) enzymes and lipid- transfer protein) and environmental factors (e.g. exercise, diet and alcohol) that influence HDL concentration[3,4]. The lipid-Oxidation hypothesis proposed by Steinberg and Michinson suggest that high concentration of LDL are not atherogenic unless their oxidation (or other modification) leads to macrophage uptake and activation[5,6]. This study aimed to estimate the prevalence of hyperlipidemia and associated ischemic factors in two hundred patients with AMI.

PATIENTS AND METHODS:

From October 2004 to October 2006 two hundred patients with AMI were studied at coronary care unit in Diwanyia Teaching Hospital; 128 males and 72 females, their ages ranged between (30-78) mean age 54 year the diagnosis of AMI was based on at least two of the following three criteria

1-Clinical history of chest pain, typically AMI results in sever chest pain lasting more than 30 minutes and unrelieved by sublingual nitroglycerin.
2-ECG criteria of AMI or evolving infarction, the earliest ECG change is usually ST elevation, later on there is diminution in the size of the R wave and in transmural (full thickness) infarction a Q wave begins to develop.
3-AMI causes a detectable rise in the plasma concentration of enzymes and proteins that are normally concentrated within cardiac cells, the most widely used enzyme in detection of AMI is (CK-MB) and the cardio specific proteins troponins T and I (which were not available in our hospital), other enzymes are Aspartate aminotransferas (AST) and lactate dehydrogenase (LDH).
Five milliliters of blood was obtained from all patients with AMI within 8h of the event; lipoprotein estimation was done by enzymatic methods, kits used for lipid profile analysis made by: Biomerieuxvitck inc. 595 Anglun Drive Hazelwood, MO 63042-2395 U.S.A. Patients with secondary hyperlipidemia a part from diabetes mellitus and those with triglyceride more than 400mg/dl were excluded from the study. Hyperlipidemia was considered if serum level of cholesterol was more than 240mg/dl and LDL more than 100mg/dl or a combination of LDL more than 100mg/dl and HDL less than 35mg/dl[8.] Women were considered premenopausal if their ages range between (33-44) year and postmenopausal if their ages were above (44) year[9] clinical and demographic characteristics were also recorded from each patient.

RESULTS:

LDL-C of more than 100mg/dl is found in 154(77%) patients. While HDL-C of less than 35mg/dl is found in 56(28%)patients. Table-1. 44(22%) of patients have combined HDL-C level less than 35mg/dl and LDL-C more than 100mg/dl ; 42 patients (21%) have serum cholesterol more than 240mg/dl.

Table-2: 32(16%) patients have LDL-C level between (130-160mg/dl) and 32(16%) of patients have LDL-C level between (160-190mg/dl) while only 26(13%) patients have LDL-C more than 190mg/dl.

Table 1. The lipoprotein abnormality in studied patients.

Level of LDL mg/dl	No.	%	Sex M F	Level of HDL mg/dl	No.	%	Sex M F
100- 130	64	32	40 24	-	-	-	-
130- 160	32	16	20 12	<35	64	28	28 28
160- 190	32	16	16 16	-	-	-	-
>190	26	13	14 12	>35	144	72	94 50
Total	154	77	90 64	-	-	-	-

Table-2: The lipoprotein abnormality in studied patients

No. of patients with s.cholestrol>240mg/dl	No. of patients with LDL>100mg/dl	No. of patients withHDL<35mg/dl	No. of patients with combination LDL>100&HDL<35
Total 42	154	56	44
Male 30	90	28	26
Female 12	64	28	18

The total number of smoker patients without hypertension and diabetes is 76 patients; 12 of them have serum cholesterol more than 240mg/dl, 56 have LDL more than 100mg/dl, 14 have HDL-C less than 35mg/dl. (Table-3) The total number of hypertensive patients without diabetes &

smoking habit is 36, 14 of them have serum cholesterol more than 240mg/dl, 20 have LDL-C more than 100mg/dl and only 8 have HDL-C less than 35mg/dl. Table -3. The total numberof studied diabetic patients is 36, 30 of them have serum triglyceride of less than 200mg/dl and 8 of them have no associated hypertension neither smoking habit, 4 of these 8 have LDL-C of more than 100mg/dl and HDL-C of more than 35mg/dl.

Table-3: The lipoprotein abnormality associated with each ischemic factor separately in studied patients.

Ischemic Factors	S.cholestrol>240 Sex M	F	T	LDL>100mg/dl Sex M	F	T	HDL<35MG/DL Sex M	F	T	Combination HDL<35& LDL>100 M	F	T
Smoking	20	4	24	48	8	56	12	2	14	10	2	12
Diabetes	-	-	-	2	2	4	-	-	-	-	-	-
Hypertension	6	8	14	6	14	20	2	6	8	2	4	6

54 postmenopausal women have serum LDL-C>100mg/dl and 26 of them have HDL <35mg/dl, while the two premenopausal patients their LDL-C more than 100mg/dl and HDL-C more than 35mg/dl. Table-4. 20(10%) of patients have no ischemic risk factor.

Table 4. The lipoprotein abnormalities in women

Women patient	No.	S.cholestrol>240mg/dl	LDL>100	HDL<35	Combined LDL>100&HDL<35mg/dl
Premenopausal	2	-	2	-	-
Postmenopausal	70	18	54	26	10
Total	72	-	-	-	-

DISCUSSION:

This study has shown that HDL-C level of less than 35mg/dl is found in 56(28%) of patients, by contrast to the hypothesis proposed by Steinberg and Mitchinson who have suggested that 50% of all patients with coronary artery diseases have low concentration of HDL-C[6]. 76(38%) of patients have smoking habit without associated hypertension or diabetes mellitus. 24 of them have serum cholesterol more than 240mg/dl; 56 have LDL-C more than 100mg/dl and 14 patients have HDL-C of less than 35mg/dl. Thus in this study smoking is an important predictor of acute myocardial infarction since it has a greatest impact on LDL-C rather than HDL-C. In contrast to other studies which have suggested that smoking may raise total cholesterol by raising LDL-C and the greatest impact on the HDL-C[8]. 18 patients have diabetes, 15 of them have their triglyceride level below 200 mg/dl . The prevalence of

lipoprotein abnormalities observed in this study and the low triglyceride level among diabetic patients, reflect the dietary pattern of our population which consist of high fiber diet[5,6] . 27 post menopausal women out of 36 women have their LDL-C more than 100 mg/dl, only two premenopausal women Table-2: 32(16%) patients have LDL-C level between (130-160mg/dl) and 32(16%) of patients have LDL-C level between (160-190mg/dl) while only 26(13%) patients have LDL-C more than 190mg/dl.

h groups is partly attributed to estrogen effect[10] . 20(10%) of patients have shown no ischemic factors. It seems that lipoprotein abnormalities will not alone play a trigger role in the studied patients . Because of low immunity, anemia and stress full life , our people had faced during the period of sanction imposed on our country, which all have a role in triggering a variety of infections , including Chlamydia and Helicobacter pylori and since Chlamydia and H. pylori have a role in acute myocardial infarction[11] , therefore some of our patients with myocardial ischemic process can be explained by factors other than atherosclerosis.

REFERENCE:

1.Burton E.Sobel, Acute myocardial infarction , Thomas Woodward Smith, Cecil Text Book of medicine, Philadelphia W. B saunders company 1998;302.

2. Henry N. Ginsberg Iraj. Golden , Disorder of lipoprotein metabolism, Dennis I. kasper, et al, Harrison, principles of internal Medicine New York, Mc Graw-HILL, 2002,

3. Greaves DR, Gough pj, Gordous. Recent progress in defining the role of scavenger receptors in lipid transport, atherosclerosis and host defense.

4. Oram JF, Yokoyamas. Apo lipoprotein-mediated removal of cellular cholesterol and phospholipids J lipid Res 2002.

5. Steinberg D, Parthasarathy S, Carew TE, Khoo JC, Witztum il. Beyon cholesterol: Modification of low density lipoprotein that increase its atherogenicity, N Engi J.Med 2003.

6. Mitchin MJ. Macrophages, oxidized lipids and atherosclerosis Med Hypoth 1999;12:171-78.

7. Dillon, M.D, et al. Diagnostic problems in acute myocardial infarction. Arch, internal Med2002;

8. Jonathan skillings, BS, PA-C, Debra G, Howes RN ,MSN. Hyperlipidemia and atherosclerosis part 2, PHYSICIAN ASSISTANT, 2003;32-57.

9. D. ADAVEY , the menopause and climacteric, CHARLES R. WHITFIELD, Dewhursts. Textbook of obstetrics and Gynecology for postgraduates, Hong kong, Black well science, 2003;610.

10. Hullex SB , newman TB, Grady D, et al. Should we measuring blood cholesterol levels in young adult; JAMA; 2002; 269: 1416-1419.

11. Wolfgang Koenig, Heart disease and inflammatory response, BMJ, 2002; 321:187-188.