
Hypercholesterolemia and Acute Myocardial Infarction

Abdul-Kareem Al-Shamary
CABM*

Media Noori Ibraheem
MSc. **

Abstract: The relation of serum cholesterol and LDL-C with the development and progress of atherosclerosis and CAD has been demonstrated in numerous clinical and epidemiological studies.

Patients & Methods: Fifty patients admitted to the coronary care unit (CCU), in Al-Yermouk teaching hospital, in the period between March to December 2007 had been studied prospectively for lipid profile and other risk factors.

Result: The level of total serum cholesterol was greater than 200 mg/dl in 32 patients (64.0%), while the level of LDL-C was greater than 130 mg/dl in 25 patients (50%), and the level of HDL-C was less than 35 mg/dl in male, and less than 45 mg/dl in female, in 9 patients (18%).

Discussion: Risk factors reduction is the primary clinical approach to preventing CAD morbidity and mortality. Epidemiological studies have clearly demonstrated that hypertension, smoking and dyslipidemia are the major risk factors of CAD which acts in a synergistic manner, so patients with lipid abnormalities should be early detected and carefully managed to prevent MI.

Keywords:

Introduction

The relation of serum cholesterol and LDL-C with the development and progress of atherosclerosis and CAD has been demonstrated in numerous clinical and epidemiological studies. Moreover, the benefit of LDL-C cardiovascular events).

Flow, prevent platelet and leukocyte adhesion to the vessel surface, modulates cellular composition of the arterial wall, and promotes dilator tone of arteries and veins, homeostatic properties regulated in part by the local synthesis of nitric oxide. Several groups have shown that endothelial release of nitric oxide is reduced or absent in patient with atherosclerosis, as well as in patients with risk factors for atherosclerosis, including hypercholesterolemia.^[2]

In the last 2 decades, in-hospital mortality for acute coronary syndromes has decreased markedly. To continue to make progress and to meet the goal set by the American Heart Association (AHA) of reducing coronary heart disease (CHD) and stroke by 25% by 2010, the focus of treatment in patients hospitalized with CHD must evolve from treating symptoms of the disease to treating the underlying disease process of atherosclerosis.^[3]

It is clear that phasic change in serum lipid do occur in patients following MI and therefore there is a recommendation for detection of hyperlipidemia in patients with acute MI that the serum lipid should be assessed either within 24 hours after infarction or after 2-3 months of acute MI.^[4]

In Iraq only limited systematic data is available on the epidemiology of cardiovascular disease (CVD). Most of these data suggest a high cardiovascular risk profile, similar to neighboring Arab countries; however, the magnitude of risk still needs to be assessed.^[5]

Patients & Methods

We prospectively studied fifty patients admitted to coronary care unit (CCU), in Al-Yermouk teaching hospital, in the period between March to December 2007. The demographic and clinical characteristics of patients, the prevalence of major risk factors, diabetes mellitus, hypertension, obesity and smoking were studied. The diagnosis of AMI was based on a history typical chest pain or its equivalent, a standard 12 leads ECG were taken, ST elevation myocardial infarction (STEMI) were classified into anterior, inferior, antro-septal and antrolateral according to leads involved in ST elevation.^[6] The patient blood pressure was recorded to the nearest 5 mm Hg at the fifth Korotkoff sound, using a mercury sphygmomanometer. Blood drawn for determination of fasting blood sugar (FBS), total cholesterol, high density lipoprotein (HDL). Blood sample were transported to the main laboratory in hospital on the same day.

The total cholesterol and HDL were measured by using enzymatic colorimetric method, and the LDL was measured by Friedewald formula.^[6]

Results

The study group composed of 50 patients, 41 of whom were male (82.0%) and 9 of whom (18.0%) were female. The average age was (59.92±11.24), range; 35-83 years. The average weight was 81.64±12.23 Kg, (range; 58.0-110) (Table 1). The number of diabetic patients were 15 (30%), with mean blood sugar of 147.70±80.12, range : (64.0-450.0). The number of hypertensive patients were 27 (54.0%). The number of smokers were 27 (54.0%). (Table 2). According to the types of myocardial infarction ,anterior MI were 10 patients (20.0%), antro-septal were 9 patients (18.0%), antro-lateral were 1 patients (2.0%), while inferior were 30 patients (60.0%). (Table 3). Regarding the level of total cholesterol ,it was

greater than 200 mg/dl in 32 patients (64.0%), with a mean of 219.42 ± 57.40 , and a range of (115.0-350.0), while the level of LDL-C were greater than 130 in 25 patients (50.0%), with a mean of 135.74 ± 53.75 , and a range of (49.0-254.0), and the

level of HDL-C less than 35 in male, less than 45 in female were risky in 9 patients (18.0%), with a mean of 46.18 ± 12.95 , and a range of (30.0-78.0). (Table 4).

Table 1: The demographic characteristics of the hypercholestermic patients with MI

	No	%
Sex Male	41	82.0%
Female	9	18.0%
Age (years) <50	9	18.0%
50--59	13	26.0%
60--69	16	32.0%
70--79	8	16.0%
=>80	4	8.0%
Mean±SD (Range)	59.92±11.24	35.0-83.0
Weight Mean±SD (Range)	81.64±12.23	58.0-110.0
Blood sugar Mean±SD (Range)	147.70±80.12	64.0-450.0

Table 2: The medical and social history of hypercholestermic patients with MI

	No	%
Diabetes mellitus Yes	15	30.0
No	35	70.0
Hypertension Yes	27	54.0
No	23	46.0
Smoking Yes	27	54.0
No	23	46.0

Table 3: The type of myocardial infarction

	No	%
Type of MI Anterior MI	10	20.0
Antero-septal	9	18.0
Antero-lateral	1	2.0
Inferior	30	60.0

Table 4: The lipid profile of MI patients.

	No	%
Total cholesterol Risky (TCh=>200)	32	64.0
Not	18	36.0
Mean±SD (Range)	219.42±57.40	115.0-350.0
LDL-C Risky (LDL-C=>130)	25	50.0
Not	25	50.0
Mean±SD (Range)	135.74±53.75	49.0-254.0
HDL-C Risky (HDL-C=<35 M; =<45 F)	9	18.0
Not	41	82.0
Mean±SD (Range)	46.18±12.95	30.0-78.0

Discussion:

CAD is the epidemic of our time, and set to remain the single most important disease in the world in the term of mortality, morbidity, disability and economic loss until 2020 year^[6]. This chronic disease has an enormous impact on quality of life. Its risk factors accelerate or modify a complex and chronic inflammatory process that ultimately manifest as fibrous atherosclerotic plaque, the clinical coronary events follow plaque rupturing. The presence and the number of CAD risk factors predict the future cardiovascular events in individuals with such factors.

The development of the concept of risk factors and their relationship to the incidence of CAD evolved from prospective epidemiological studies in united states and Europe^[7]. The identification of risk factors provides a means for decreasing CAD risks, through the reduction of modifiable risk factors, and better treatment decision, though more accurate determination of overall risk status^[8]. Risk factors reduction is the primary clinical approach to preventing CAD morbidity and mortality^[9]. Epidemiological studies have clearly demonstrated that, hypertension, use of tobacco and dyslipidemia are the major risk factors of CAD which act in a synergistic manner^[9].

In our patients with AMI, there was a high rate of smoking (54.0%), but diabetes mellitus (30.0%), hypertension (54.0%), and hypercholesterolemia (64.0%). While in a study conducted in Yemen^[10], the rate of smoking was very high (81.0%) that because of high rate of chewing of Khat, diabetes mellitus (25.0%), hypertension (18.0%) and hypercholesterolemia ((29.0%). This shows a high difference in the cholesterol level in our country, this may be explained on the change of lifestyle and eating pattern. In a study conducted in Oman by Prashanth Panduranga, et al,^[11] 37% of patients with acute coronary syndrome were diabetic, this proportion is high compared with western countries, but lower than the rest of the Gulf (40%),^[12] and Saudi Arabia (53%),^[13]. While in our study (30%). Diabetic patients had higher percentages of hyperlipidemia, and hypertension.^[11] Based on these findings, patients with lipid abnormalities should be early detected and carefully managed to prevent MI,

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*lecturer- Department of Medicine- College of Medicine- Al-Mustansiriyah university.

** Al-Yermouk teaching hospital.