

## The Relation of Hyperlipidemia with IHD in young and middle age in Tikrit city

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### Abstract

Hyperlipidemia is a major risk factor of ischemic heart disease (IHD). Many studies have demonstrated a direct correlation between raised serum lipids levels and incidence of IHD and atherosclerosis in humans. One hundred fifty healthy control individuals (86 male and 64 females) and (150) patients suffering from previous IHD (84 males and 66 females) were involved in this study. The blood samples from these groups were analyzed for serum total cholesterol, triglycerides, low- density lipoprotein, and high- density lipoprotein .All control individuals have a normal fasting blood glucose, normal resting electrocardiograph, blood pressure and serum lipids.

The results revealed highest frequency of IHD in males (29.76%) and females (25.76%) among the age group (50-59) years. Also it showed that about (25%) of males and (24.24%) of females who were suffering from IHD were below 40 years.

## **Introduction**

Ischemic heart diseases (IHD) are a leading cause of mortality and morbidity in industrial countries, and they are also emerging as a prominent health problem in developing countries [1]. IHD is characterized by widespread and severe atherosclerosis. It may manifest itself as an acute and often fatal attack of Myocardial infarction (MI), or as an angina pectoris, congestive heart failure, or arrhythmia [2]. The increase in incidence of atherosclerosis and subsequently coronary heart disease (CHD), Myocardial infarction (MI), Cerebrovascular diseases and other diseases have focused the attention on the important role of nutrition and health in the world, especially in developed countries. The incidence of these diseases in developing countries has increased in the last (15) years as result of the enhancement of the economic situation, which suggests that environment and dietary habits may contribute to these diseases [3,4]The relationship between plasma lipid abnormalities and the risk for ischemic heart disease (IHD) is now clearly established. In addition to quantitative abnormalities such as increased plasma low density lipoprotein cholesterol (LDL-Cholesterol) and decreased high-density lipoprotein cholesterol (HDL-Cholesterol) levels, lipid qualitative abnormalities are likely to play an important role in the pathogenesis of atherosclerosis [5]. Hyperlipidemia (HL) is a common disease that leads to considerable morbidity and mortality. It is a major risk factor for the development of atherosclerosis [6]. Ischemic heart disease can be considered as the major cause of death in the world in about (50) countries and mortality is higher than that caused by cancer, accident or communicable disease [8]. Prior to World War II, IHD was considered to be uncommon event in patients under (40) years of age [9]. The present study is undertaken to find out the rate of hyperlipidemia in ischemic heart disease and its relationship with young and middle age patients with IHD.

## **Material and Methods**

Blood samples were taken from (150) healthy control individuals (86 male and 64

females) and (150) patients suffering from previous IHD and admitted to the cardiac care unite (84 males and 66 females) in Tikrit city from November 1999 to July 2000. The blood samples from these groups were analyzed for measuring serum total cholesterol, triglycerides, phospholipids, low-density lipoprotein, very low-density lipoprotein, and high-density lipoprotein by enzymatic methods. All control subjects were volunteers. They had normal resting electrocardiogram (ECG) and normal serum lipids had no history of IHD, hypertension (HT) or diabetes mellitus.

## **Results**

The distributions of sex and age of patients and control group were given in Table (1). It showed that the highest frequency (56.67%) was recorded among males, while (43.33%) were females. It was seen in both sexes that suffer from previous IHD was more obvious at age 50 to 59 years. The highest frequency (29.76%) of IHD among males was in age group (50-59) years and the lowest frequency (10.71%) in age groups (20-29). While in females higher frequency was (25.76%) in the age group (50-59) years and the lowest frequency (12.12%) in age groups (20-29) and (30-39). The table also showed that females after age of 50 years became more susceptible than males. The correlation between IHD and age groups were statistically significant the P values found to be ( $<0.05$ ). Results of the present study are given in the Figures (1-2). It is evident from (Figure 1 (A)) that the means of serum total cholesterol (TC) and (Figure 1 (B)) means of serum triglyceride (TG) concentration both in the males and females are higher as compared to the reported normal values in literature [10,11,12].

The results of (TC) and (TG) are shown in the figure (1 A and B). It was observed that there were significantly differences in mean levels of (TC) in IHD with hyperlipidemia in comparison with IHD at upper limit of lipids groups and also more than that in control groups ( $P<0.05$ ), the same result detected in mean levels of (TG). In contrast the difference between control and IHD at upper limit of

lipids groups were statistically insignificant .in the same figure the difference in mean levels of (TC) and (TG) between he age groups were statistically significant ( $P<0.05$ ). The values of serum HDL-cholesterol and LDL- cholesterol were given in the figure (2 A and B). It was shown that the levels of HDL-C and LDL-C in control groups increased with age until (60-69) years and then decline. In the same figure the difference in the mean values of HDL-C between control groups and IHD with hyperlipidemia, and between control and IHD at upper limit of lipids groups revealed statistically significant decrease ( $P<0.05$ ). In contrast there were no statistically significant decrease in the values of HDL-C between IHD with hyperlipidemia groups and IHD at upper limit of lipids groups. The figure also showed that there were statistically significant increase in the levels of LDL-C when comparing groups (control, IHD at upper limit of lipids and IHD with hyperlipidemia) ( $P<0.05$ ). The levels of LDL-C statistically significant ( $P<0.05$ ) in comparison between age groups.

## Discussion

During past 5 decades a large number of studies have been performed concerning the effect of age and sex on IHD and its correlation with blood lipids and lipoproteins levels in several populations [10,11]. Interest in serum lipid concentrations in health and disease have been greatly stimulated since a close correlation was found between the raised fasting serum lipid concentrations and the prevalence of IHD [12,13].Hyperlipidemia may only accelerate blood clotting [14] but

also increases blood viscosity as well as producing increased adhesiveness and aggregation of red blood cells [15]. It had also been shown that variations in both fat and carbohydrate composition of the diet rapidly induce changes in serum lipid fractions with immediate effects on serum cholesterol. The diet of a common Iraqi individual includes apparently excess amounts of carbohydrate, fat and proteins, which may influence serum lipid concentrations.

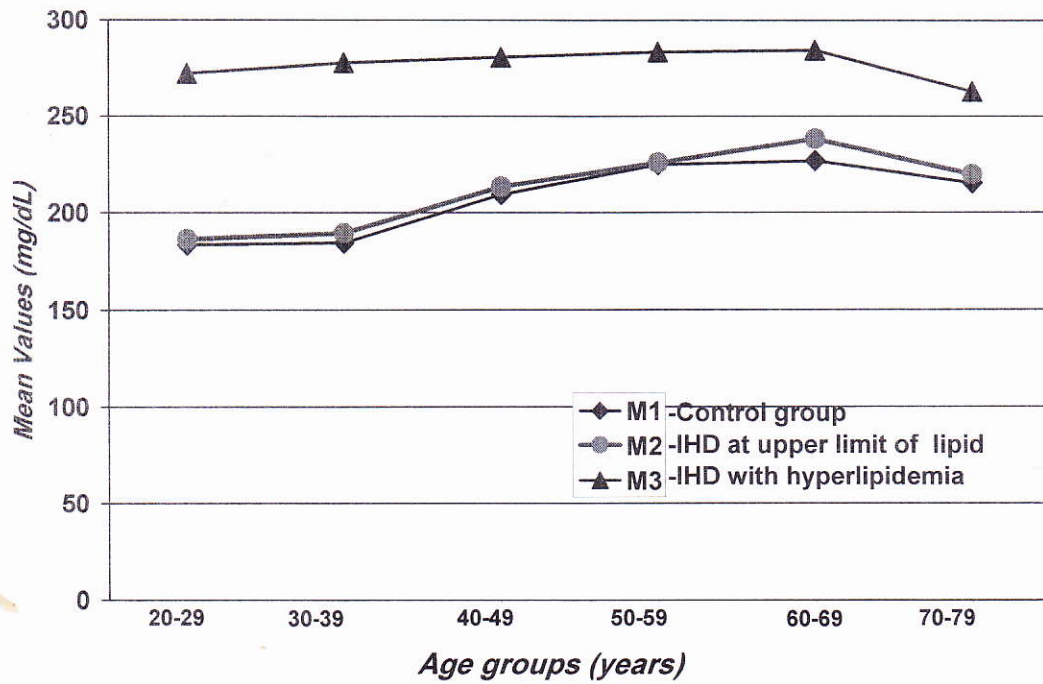
This study we showed that the percentage of patients with IHD in young age groups increased which may indicate that the patients are more prone to risk factors at earlier age groups. The results of the present study revealed that the levels of (TC),(TG) and LDL-C were increased in patients suffering from previous sign of IHD. It also showed in the same figure that the level of HDL-C was lower in IHD groups in comparison to control groups .The results of the present study have also detected that the levels of serum lipids were significantly increase with age. Slightly higher levels of serum lipids in the males than females in early age were also found, in contrast they were higher in females than males in age groups more than 50 years. These results were in agreement with that report by Heiss et al.[16]. The higher values of serum total cholesterol and a progressive rise in serum lipid except HDL- cholesterol with age could be related to the high carbohydrate and fat intake by these individuals, causing a state of preexisting lipemia with increasing its expression with advancement of age [17]. The elevation in serum LDL-cholesterol may be due to low clearance rate caused by glycosylation [18].

**Table (1): Age and sex distribution of Ischemic heart diseases (IHD)**

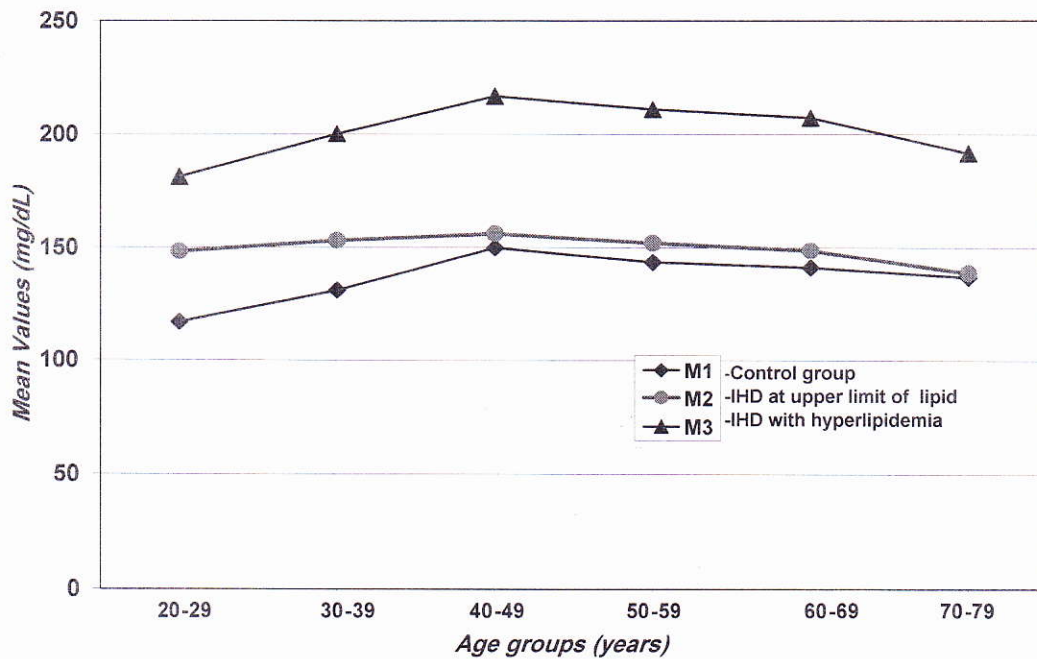
Age groups in years	Males		Females		Total
	Control	Disease	Control	Disease	
	N <sub>0</sub> (%)	N <sub>0</sub> (%)	N <sub>0</sub> (%)	N <sub>0</sub> (%)	
Group A (20-29)	10 (11.63)	9 (10.71)	10 (15.63)	8 (12.12)	37
Group B (30-39)	20 (23.26)	12 (14.29)	10 (15.63)	8 (12.12)	50
Group C (40-49)	20 (23.26)	15 (17.86)	12 (18.75)	10 (15.15)	57
Group D (50-59)	20 (23.26)	25 (29.76)	12 (18.75)	15 (22.73)	74
Group E (60-69)	10 (11.63)	13 (15.48)	12 (18.75)	15 (22.73)	50
Group F (70-79)	6 (6.98)	10 (11.90)	8 (12.5)	8 (12.12)	32
Total	86	84	64	66	300

Percentage of Males =56.67%.Percentage of Females =43.33%.

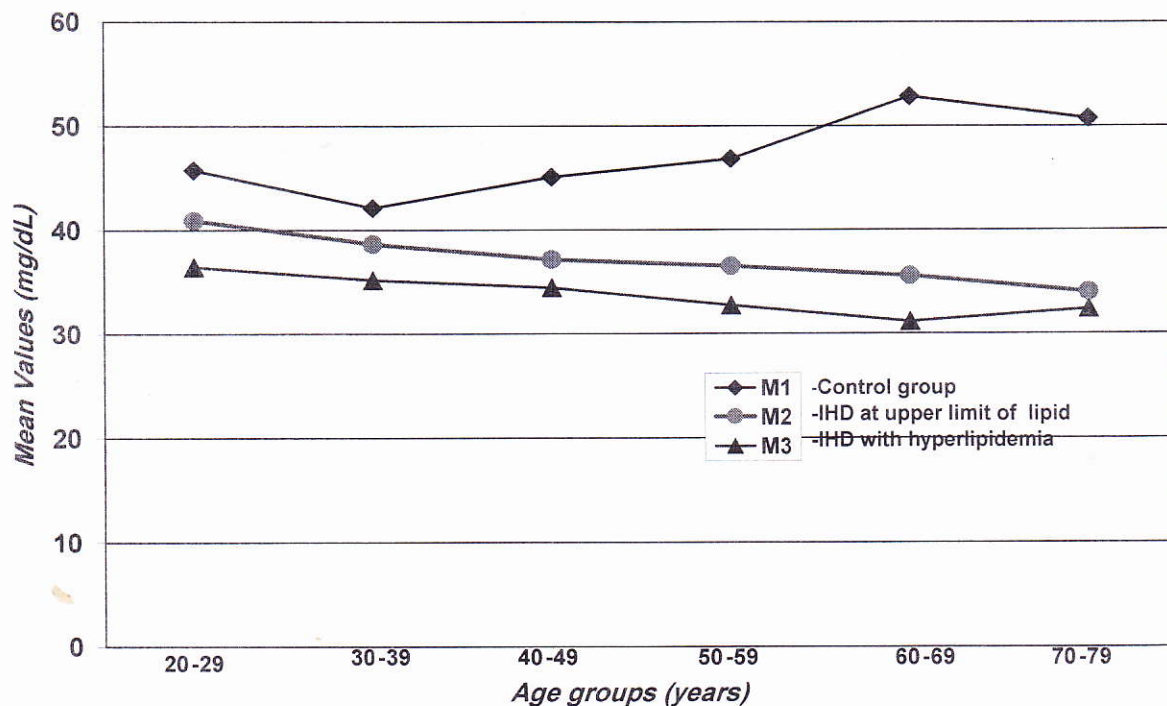
Figure(1A): Mean values of serum total cholesterol (mg/dL) in patients with ischemic heart disease in different age groups



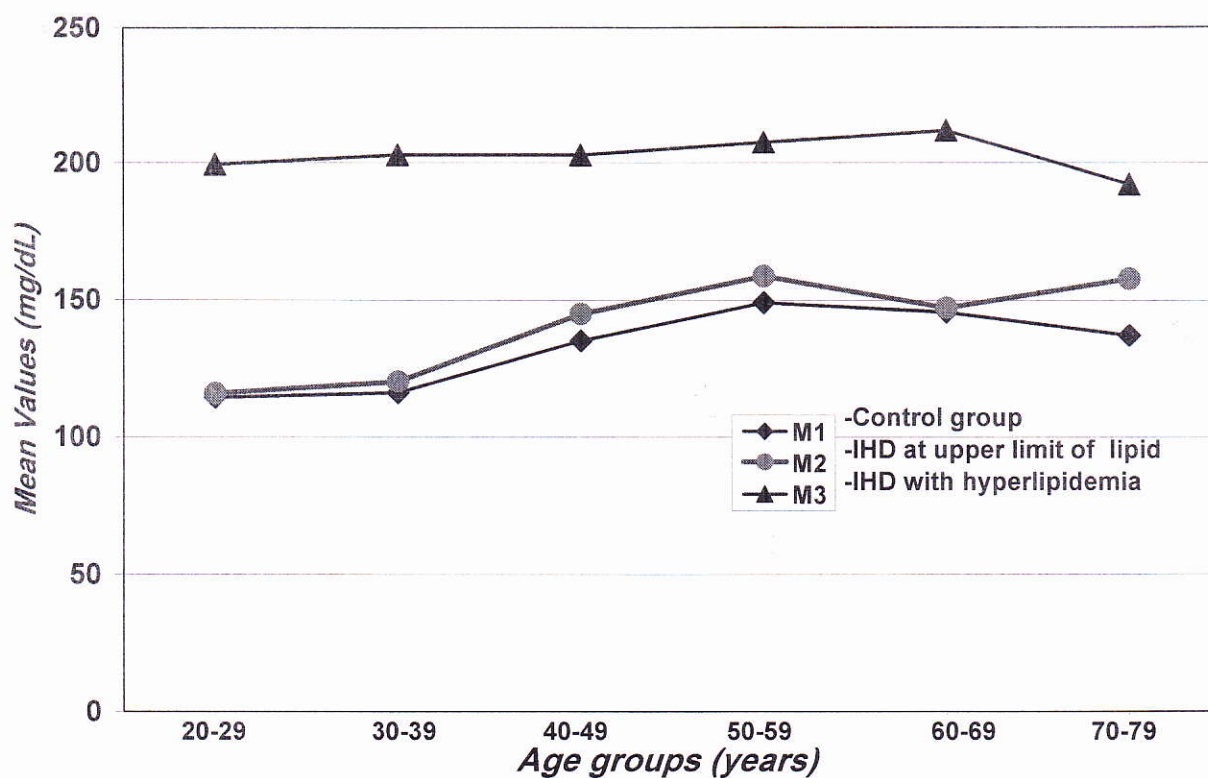
Figure(1B): Mean values of serum triglyceride(mg/dL) in patients with ischemic heart disease in different age groups



Figure(2A): Mean values of serum HDL- cholesterol (mg/dL) in patients with ischemic heart disease in different age groups



Figure(2B): Mean values of serum LDL- cholesterol (mg/dL) in patients with ischemic heart disease in different age groups



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