

## Study the level of some serum lipid profile parameters in patients with an ischemic heart disease

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### Abstract

Ischemic Heart Disease (IHD) is a dangerous because it restricts the blood flow to the arteries which lead to a atherosclerosis.

The study aimed to detect the effect of serum lipids on the IHD occurrence for ( 59)patients in Kirkuk General hospital form the period of 1<sup>st</sup> September /2014 till the end of December 2014.

The serum lipids including Triglycerides(TG),Cholesterol and High density lipoprotein (HDL) were estimate by using enzymatic colorimetric method.

The study result indicated that there is a significant relationship between cholesterol and TG level and disease occurrence among the age group (60-69) and (70-79) years of age and there was a statistically relationship between these biochemical variable (cholesterol, HDL and TG in IHD occurrence in female.

The study concluded that (TG) level in blood is one of the important risk factor in IHD development .

**Keywords:** Kirkuk, HDL ,General hospital, effect .

### Introduction

Ischemia means a reduction in blood supply ,therefore Ischemic Heart Disease (IHD)can be called coronary artery disease decrease in blood reaching to the heart that affecting its function<sup>[1]</sup>.

Cardiac ischemia is another name for reduction in blood flow and oxygen supplementation to the heart muscle which is mainly resulted from deposition plaque that build up in the arteries of the heart. <sup>[2,3]</sup>

Most ischemic heart disease , caused by atherosclerosis which is initially presented by narrowing are closure of the main arteries then gradually complete blockage occur . <sup>[4]</sup>

Cholesterol is one type of lipid that affecting IHD and resulting in decrease in myocardial demand and later narrowing of the coronary arteries, stenosis and intraluminal thrombosis because of platelet aggregations and vasoconstriction . <sup>[5,6]</sup>

Up to 90% of heart disease caused by certain essential risk factors that reverse the chance of depending it. These risk factors including, smoking high cholesterol level, high blood pressure, diabetes mellitus, lack of exercise, stress and alcohol drinking. <sup>[7,8]</sup>

Tobacco is regarded as the main important risk factor for IHD occurrence and there is a strong relation between dose-linked cigarette smoking and increase the risk of coronary heart disease. <sup>[9]</sup> Another risk factor is obesity and dietary deficient in fresh fruit and unsaturated fatty acids.

The incidence of IHD is gradually increase mainly in group and other developing countries and an

approximately 100.000 people having myocardial infarction each year and about 1-7 million angina pectoris. <sup>[10]</sup>.

The aim of the study is to determine the relation between IHD and serum lipids including (cholesterol, triglyceride, and high-density lipoprotein) in order to predict the preventive and management measures .

### Methodology

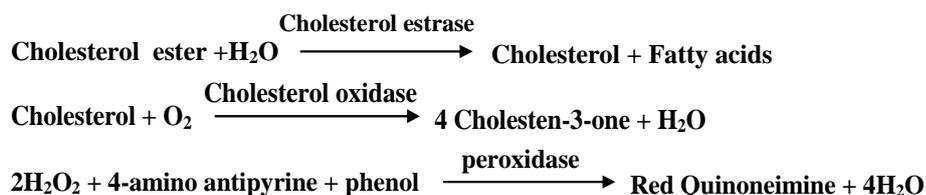
Across- sectional study was conducted in Kirkuk general hospital from the period at september/2014 till the of December 2014 on 59 patient a admitting in the coronary care unit after receiving the agreement from the hospital office.

A full history was taken from these patients either from them directly or from their nearest relatives in case of critical disease. Each patient was submitted to laboratory investigation for cholesterol , triglyceride and high density lipo protein diagnosis.

A sample of blood was taken from them and sent to main lab in Kirkuk general hospital for serum lipids investigation by using enzymatic colorimetric as the following procedure :

#### 1-Serum cholesterol level:

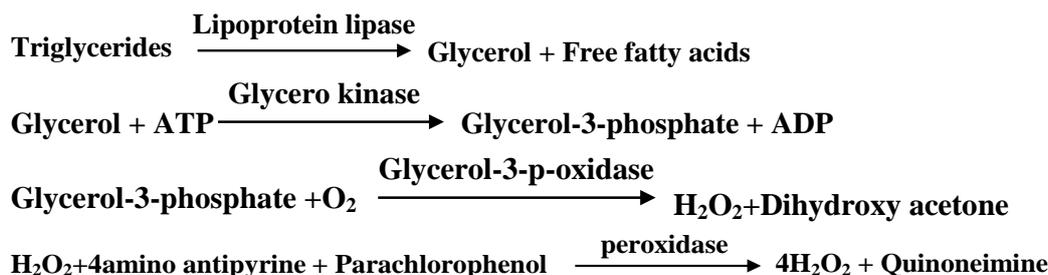
Cholesterol measured by using ( a kit ) made by accompany called which is ( biolabo, France )company. The method is based an converting cholesterol and enzymatic cholesterol esters to Quinonimine with a purple color according to these equations :<sup>[11]</sup>



Then the result was read at a wave length (500) Nanometer by using spectrophotometer and cholesterol concentration was calculated by this formula:

$$\text{Cholesterol Concentration} = \frac{\text{light absorption of lipoprotein}}{\text{Light absorption of the standard cholesterol solution}} \times \text{standard solution concentration}$$

2- Serum triglycerides level (TG): Serum triglycerides was measured by using a kit made by a Syrian company called (Biolabo, France) according to these equations <sup>[11]</sup>:



The result was read at a wave length (546) Nanometer by using spectrophotometer and their concentration was calculated according to this formula :

$$\text{Triglycerides concentration (mg /dl)} = \frac{\text{lightabsorption of seurm sample}}{\text{lightabsorption of the standerd solution}} \times \text{standerd solution concentration}$$

### 3- Serum high density cholesterol level (HDL-C):

High density lipo protein was measured by using a synthetic kit made by a company called (biolabo, France) <sup>[11]</sup>.

This method is depended on the kilo microns, low density lipoprotein and very low lipoprotein are sediment by phosphotungistic acid and magnesium ions using centrifuge while high density lipoproteins remain soluble in the solution and there are can be measured its concentration through taking (50) micro

liter from the blood, the standard solution and distal water.

Three dry clean tubes were used for this purpose and 1 ml was added from cholesterol enzymatic solution to all these tubes mixing carefully, putting them in water bath at 37 c0 for 5 minutes then the absorption results were read at a wave length (500) nanometer using a spectrophotometer and the HDL concentration were measured according to the formula:

$$\text{HDL-C concentration (mg /dl)} = \frac{\text{lightabsorption of seurm sample}}{\text{lightabsorption of the standerd solution}} \times 50 \times 101$$

50 = Standard solution concentration for HDL –C  
101 = Dilution factor.

Data was collecting from there readings and using SPSS version -16- for evaluation of results.

### Result

Table 1: Frequency distribution of study sample according to the age group regarding the mean

Age groups (years)	Number Examined N=59	Cholesterol-mmol (± S.P)	T.G. - mmol (± S.P)	HDL-C. IU/L (±S.P)
40-49	7	4.13 ± 0.80*	2.19 ±1.42**	1.22 ±0.34**
50-59	22	4.83 ±0.90*	2.37 ±1.21	1.05 ±0.27**
60 - 69	15	4.58 ± 1.27*	1.83 ±0.82	1.11 ±0.35**
70-79	13	4.59 ± 0.76*	2.28 ±1.36	0.96 ±0.37**
80-85	2	4.85 ± 1.06	1.02 ± 0.38	1.27 ±0.60
Total	59	4.64 ±0.96	2.15*1.17	1.08 ±0.33

Table (1) that the means of cholesterol, triglyceride and HDL was increased in ischemic heart disease especially in age group (40 - 49) years. There was a

significant relation between cholesterol and HDL among age range (50-59), (60-69) and (70-79) years with a p-value=( $p < 0.01$ ) .

**Table 2: Frequency distribution of ischemic patients according to mean analysis**

Age groups (years)	Number Examined	Cholesterol-mmol ( $\pm$ SD)	T.G - mmol ( $\pm$ SD)	HDL-C-mmol ( $\pm$ SD)
40-49	5	3.96 $\pm$ 0.55*	1.74 $\pm$ 1.33	1.36 $\pm$ 0.23**
50-59	8	4.3 $\pm$ 0.86*	2.69 $\pm$ 1.57	1.01 $\pm$ 0.26**
60-69	10	4.53 $\pm$ 1.24*	1.98 $\pm$ 0.87**	0.96 $\pm$ 0.31
70-79	8	4.54 $\pm$ 0.68*	1.89 $\pm$ 0.84**	0.95 $\pm$ 0.39
80-85	1	4.1 $\pm$ 0	1.3 $\pm$ 0	1.7 $\pm$ 0
Total	32	4.40 $\pm$ 0.89	2.08 $\pm$ 1.12	1.06 $\pm$ 0.34

Table (2) that there was a significant increase in cholesterol level and HDL-C in IHD patient ( $p < 0.01$ ) among age group (40-49) years and (50-59) years.

There was significant relation between cholesterol level and Triglyceride among patient aged age (60-

69) years and (70-79) years ( $p < 0.01$ ). There was no statistically relationship between cholesterol, Triglyceride and HDL among age group between (80 - 85) years.

**Table 3: Frequency distribution of study sample regarding the mean analysis of cholesterol .TG .and HDL according to gender**

Age groups (years)	Examined number	Cholesterol-mmol ( $\bar{x}$ $\pm$ S.D)	T.Gmmol ( $\bar{x}$ $\pm$ S.D)	HDL-mmol ( $\bar{x}$ $\pm$ S.D)'
40-49	2	4.55 $\pm$ 1.48	3.33 $\pm$ 1.18	0.85 $\pm$ 0.35
50-59	14	5.11 $\pm$ 0.82*	2.19 $\pm$ 0.98	1.08 $\pm$ 0.29**
60-69	5	4.67 $\pm$ 1.47*	1.52 $\pm$ 0.72	1.4 $\pm$ 0.25**
70-79	5	4.66 $\pm$ 0.97*	2.89 $\pm$ 1.89	0.98 $\pm$ 0.38**
80-85	1	5.6 $\pm$ 0	0.75 $\pm$ 0	0.86 $\pm$ 0
Total	27	4.75 $\pm$ 1.34	2.15 $\pm$ 1.28	1.06 $\pm$ 0.39

table (3) that there was significant relation between cholesterol and HDL among age groups between (50-59) years, (60 - 69) years, and (70 - 79)years with a ( $P < 0.01$ ).

The table show that there was no statistically relationship between cholesterol and Triglyceride and HDL among female patients with IHD unlike male patient who show that there was no statistically relationship among age groups between (40 - 49) years and (80 -85) years old.

### Discussion

In this study it was found the incidence of the IHD increasing from age 40 years in both sexes and the incidence is low under 40 years and this goes with the written and mentioned information<sup>[10]</sup>

IHD occurs in any age when predispositions to atherosclerosis are present such as smoking, Hypertension, D.M, genetic hypercholesterolemia and other causes of lipidemia, this agreement goes

with report that proved age, blood lipid level (total cholesterol, HDL triglyceride) are significant for men and women<sup>[2,10]</sup> Increase IHD in male than female in reproductive age because of estrogen hormone, smoking<sup>[10,12,15]</sup>, while in menopause period, this incidence will be equal. This goes with the report that assessing IHD risk factor such as menopause status and decrease in the female hormones after menopause will lead to increase the incidence of the disease after 50 years of ages in the female patients<sup>[14]</sup>.

Increased number of female ischemic patients after the age of 50 means that there is a hormonal factor in the development of the disease and the diet plays a great role in the pathogenesis, so as the healthy diet reduces the saturated fatty acids in the blood.<sup>[15,6,7]</sup>

The elevated blood lipid level is greater risk factor for the development of ischemic HD, this agreement goes with report that proved the level of

TGL(triglyceride) where significant greater in ischemic patient [16,8]

Elevation of cholesterol is estimated as causing IHD in young age also rather than other factors [17]. This agreement goes with report that proved this severely high cholesterol was compared with severity of multiple other major risk factors for IHD. [18,19]

The elevation of TGL consider as risk factor for the development of ischemia this agreement goes with report that proved high TGL & constituent & independent risk factor for the development of IHD [20,21]

1-The cholesterol, triglyceride and HD level was increased in ischemic heart disease especially in age group (40 - 49) years.

2-There was a significant relation between cholesterol and HDL among age range (50-59) , (60-69) and (70-79) years .

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3- There was a significant increase in cholesterol level and HDL level in IHD patient with among age group (40-49) years and (50-59) years.

4-There was significant relation between cholesterol level and Triglyceride level among patient aged age (60-69) years and (70-79) years with

5-There was no statistically relationship between cholesterol, Triglyceride and HDL level among age group between (80 – 85) years.

6- there was no statistically relationship between cholesterol and Triglyceride and HDL level among female patients with IHD unlike male patient who show that there was no statistically relationship among age groups between (40 – 49 ) years and (80 -85) years old.

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## دراسة مستويات بعض معايير مرتسم الدهون في سير مرضى يعانون من مرض القلب الذوائي

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### الملخص

تعد الأمراض القلبية الاحتشائية من الأمراض الخطرة لأنه يقلل الدم الجاري للشرايين والذي يؤدي إلى مرض تصلب الشرايين . هدفت الدراسة لتحديد تأثير دهون الدم على حدوث أمراض القلب الاحتشائية إذ تم جمع 59 عينة من المرضى الراقدين في م. كركوك العام للفترة الممتدة من 1/أيلول/2014 ولغاية شهر كانون الأول/ 2014 . تم فحص دهون الدم والتي شملت (الدهون الثلاثية ، الكولسترول ، والدهون عالية الكثافة للكوليسترول) باستخدام طريقة التقدير الضوئي الإنزيمي . أظهرت نتائج الدراسة بان هناك علاقة ذات دلالة إحصائية الكولسترول والدهون الثلاثية وظهور المرض بين الفئات العمرية التي تتراوح أعمارهم بين (60 – 69) سنة وبين (70 – 79) سنة وان هناك علاقة إحصائية معنوية بين المتغيرات الكيماوية والتي تشمل (الكولسترول والدهون الثلاثية والدهون عالية الكثافة) وبين حدوث أمراض القلب الاحتشائية في الإناث . استنتجت الدراسة بان الدهون الثلاثية تعد من العوامل المهمة والخطرة في حدوث مرض القلب الذوائي .

**الكلمات المفتاحية:** كركوك ، مرض القلب الذوائي ، المستشفى العام ، تأثير