

**Study the Relationship Between Level of Cholesterol and Blood Group in Middle Age and Elderly Iraqi People**

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**Received 24 April 2016**

**Accepted 5 June 2016**

**Abstract**

The associations amongst cholesterol levels and ABO blood groups has been established but differ in many studies. Hypercholesteremia remained powerfully associated in the progress of cardiovascular diseases. The present study was carried out to estimated cholesterol concentration and blood group in the sera samples of (100) Iraqi people at the age range (20-70) years. Serum cholesterol done by auto-analyzer, while blood group by direct agglutination technique. The aim of this study to recognized whether the cholesterol level was related to ABO blood group in coronary heart disease individual. The study clarified increased concentration of cholesterol at the age (50-59 and 60-70) years other than age groups and observed that increased percentage of concentration of cholesterol in female (60%) more than male (40%). Also appeared that concentration of cholesterol increased at the blood group A+(33%), B+(28%), O+(12%) and AB+(11%) compared with other blood groups. So we concluded that cholesterol level was elevated in blood group A+ and B+ more than other blood group.

**Key words:** cholesterol, blood group.

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### العلاقة بين مستوى الكوليسترول و صنف الدم بالاعمار المتوسطة والكبار في العراقيين

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#### الخلاصة

ذكرت دراسات عديدة العلاقة بين مستوى الكوليستيرول واصناف الدم ولكنها تختلف من دراسة لآخرى وعلاقتة الشديدة بتطور امراض القلب الوعائية. الدراسة التي أجريت لقياس نسبة الكوليستيرول و صنف الدم ل 100 شخص عراقي بمعدل الاعمار (20-70) سنة. تركيز الكوليستيرول نفذ بواسطة جهاز التحليل الذاتي بينما صنف الدم اجري بواسطة تقنية التلازن المباشر. الهدف من هذه الدراسة لمعرفة فيما اذا مستوى الكوليستيرول له علاقة بصناف الدم بالاشخاص الذين لديهم امراض قلب وعائية. الدراسة وجدت زيادة في تركيز الكوليستيرول عند الاعمار (50-59 و 60-70) سنة اكثر من المجاميع العمرية الأخرى ولوحظ زيادة تركيز الكوليستيرول بالنساء (60%) اكثر من الرجال (40%) وكذلك ظهر زيادة تركيز الكوليستيرول عند صنف الدم (33%) A+ و (28%) B+ و (12%) O+ و (11%) AB+ مقارنة بالمجاميع الدم الأخرى. لذلك استنتج مستوى الكوليستيرول يرتفع باصناف الدم A+ و B+ أكثر من بقية أصناف الدم.

**الكلمات المفتاحية:** كوليستيرول، مجاميع الدم.

#### Introduction

Cholesterol is a sterol (or modifiedsteroid), helps in initiator and synthesis of steroidal hormones, bile acids, and vitamin D [1,2]. Greatest consumed cholesterol is esterified cholesterol and unwell absorbed. The body utilized a little absorption of further cholesterol through dipping cholesterol synthesis. For those causes, 7 to 10 hours when digestion cholesterol appeared minute, if any, influence on whole human cholesterol contented or focuses of blood cholesterol. On the other hand, through the beginning 7 hours after absorption of cholesterol, the level significant elevated. Cholesterol was reprocessed. The liver expel cholesterol in non-esterified shape through the gastrointestinal tract. Usually almost fifty percentage of the expelled cholesterol was reabsorption by the small intestine retain to the blood [3,4,5]. Cholesterol is necessary to keep and build membrane. It modifies membrane flexibility above the normal value of biological temperature. The "OH group" in cholesterol interrelates

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with the polar skull pools of the cell wall phospho-lipid , whereas large steroid and the hydro-carbon chain were bounded in the cell wall, a long side the non polar fatty acid chain of another fats. Through contact with phospholipid -fatty acid chains, cholesterol elevated membrane stuffing whom decrease membrane liquidity. Configuration of tetra-cyclic circle of cholesterol participate in the reduce liquidity of the cell wall as the molecule is in a transcon-formation action whole but side - chain of cholesterol firm . Basic role of cholesterol decline the permeability of the plasma cell wall to equal solute, hydrogen ion, and sodium ion[6,7]. Inside cells, cholesterol were originator molecule in numerous biochemical passage ways. In the liver, cholesterol were transformed to bile, which is subsequently kept in the gall-bladder. Bile has bile salts, which solubilizing fats in the gastro-intestinal tract and assistance in the intestine sucking of lipid molecules as well as the fat-soluble vitamins A, D, E, and K. Cholesterol was substantial originator molecule of the creation of vitamin "D" and steroid hormones, including adrenal gland hormones "cortisol" , and aldosterone, in addition to sex- hormones "progesterone, estrogens and testosterone" and other derivatives [8,9]. The "ABO system" was the greatest significant blood-group system in individual blood transfusion. The related anti-A and anti-B antibodies was generally immunoglobulin M "IgM", antibodies. ABO IgM antibodies was formed in the 1<sup>st</sup> years of lifetime by sensitization to environment materials for example diet, bacteria, and viruses. "The O in ABO is often called zero, or null"[10]. The Rhesus system (Rh) is the 2<sup>nd</sup> greatest important blood group system. The greatest important Rh antigen is the "D antigen", for the reason the maximum ready to stimulate immune system response of the 5 main rhesus system antigens. It was public for "D negative " persons not to has any "anti -D IgG or IgM antibodies", for the reason that anti-D antibodies were not commonly formed by sensitized against peripheral materials. On the other hand, D-negative person can yield IgG anti-D antibodies subsequent a immunizing results : perhaps after a fetomaternal blood transfusion to the baby in pregnancy but sometimes blood transfusion with D +ve red blood cells. Rh disease may be progress in those conditions. Existence or lack of the rhesus system antigens is denoted by the positive or negative sign, that for example the group of A- see not has slightly of the rhesus system antigens[11,12] . Some information has looked in new years suggestive of relationship between "blood groups" and different appearances of

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cardiovascular diseases. In the last few years, little information has recommended that " ABO blood groups" are related with the risk of "ischemic heart diseases "and of rising severe appearance of atherosclerosis . Whereas the battle on cholesterol have showed very productive for diet and medication manufacturing, it have brought not advantage to community condition. Heart disease was still important reason of die in western country [3,4].

### Subjects and Methods

The study was carried out during the period between five of October 2014 until the five of March 2015 .Subjects for study were (100) Iraqi people not suffering from any disease with age range (20-70) years attending to the hospital of Al-kark in Baghdad city .Blood sample was drawn in a (3ml ) plain tube for cholesterol concentration and (2ml) EDTA tube for blood group making. The age , sex for each individual were recorded. Fasting serum cholesterol done by auto-analyzer spin 120 . ABO blood groups were determined by standard agglutination techniques (Expert Diagnosis ABO blood group kit made in UAE . All the statistical analysis was done by cori 5 computer to the SPSS program (version-19).Normal value for cholesterol depend on report of the National Cholesterol Education Program [13]:

Level of cholesterol mmol/L	Interpretation
< 5.2	Required level to lower danger for heart disease
5.2–6.2	Borderline great danger
> 6.2	High danger

### Results and Discussion

One hundred blood – samples from Iraqi people have been collected. Those groups were classified in the table below according to their age range:

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Table (1): Distribution of groups according to concentration of cholesterol and age/ years

Age of Studied groups/years	Cholesterol ( mmol/l)			Total
	<5.2	5.2-6.2	>6.2	
Count 20-29	4	3	1	8
% of Total	4.0%	3.0%	1.0%	8.0%
Count 30-39	1	5	0	6
% of Total	1.0%	5.0%	.0%	6.0%
Count 40-49	6	15	5	26
% of Total	6.0%	15.0%	5.0%	26.0%
Count 50-59	4	18	11	33
% of Total	4.0%	18.0%	11.0%	33.0%
Count 60-70	8	12	7	27
% of Total	8.0%	12.0%	7.0%	27.0%
Count Total	23	53	24	100
% of Total	23.0%	53.0%	24.0%	100.0%

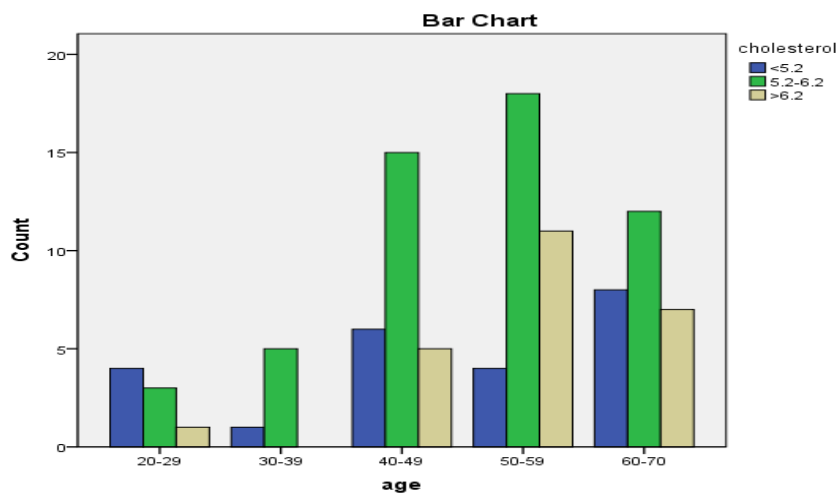


Figure (1): Distribution of group in relation to concentration of cholesterol and age/ years.

This table & figure showed increase concentration of cholesterol at the age (50-59 and 60-70) years other than age groups. This results agree with other study [6, 14, 15, 16] which observed

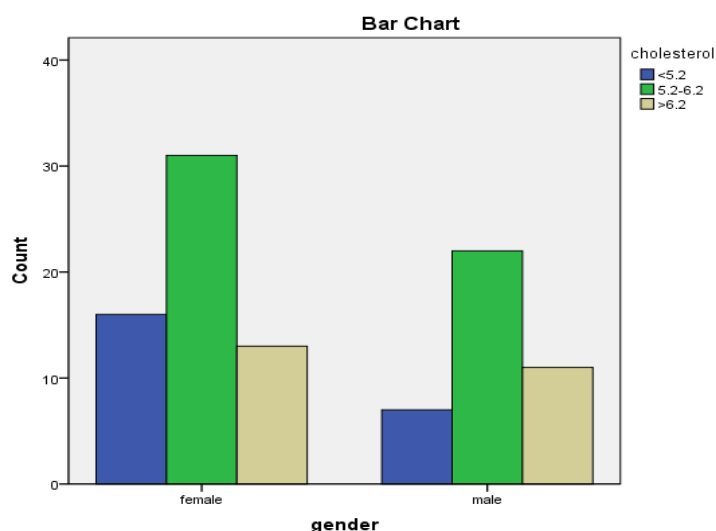
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that total cholesterol increases gradually from early adulthood through late middle age, comparatively few studies of either type have examined age-related changes in cholesterol in older populations this may be cholesterol absorption from the intestine increases with age while the excretion of cholesterol in the bile decreases.

**Table (2) : Distribution of studied groups in relation to concentration of cholesterol and gender.**

Gender of Studied groups	Cholesterol (mmol/l)			Total
	<5.2	5.2-6.2	>6.2	
<b>Female</b> <b>Count</b>	<b>16</b>	<b>31</b>	<b>13</b>	<b>60</b>
<b>% of Total</b>	<b>16.0%</b>	<b>31.0%</b>	<b>13.0%</b>	<b>60.0%</b>
<b>Male</b> <b>Count</b>	<b>7</b>	<b>22</b>	<b>11</b>	<b>40</b>
<b>% of Total</b>	<b>7.0%</b>	<b>22.0%</b>	<b>11.0%</b>	<b>40.0%</b>
<b>Total</b> <b>Count</b>	<b>23</b>	<b>53</b>	<b>24</b>	<b>100</b>
<b>% of Total</b>	<b>23.0%</b>	<b>53.0%</b>	<b>24.0%</b>	<b>100.0%</b>



(2)

**Figure**

:

**Distribution of studied groups in relation to concentration of cholesterol and gender.**

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Table(3):Distribution of studied groups in relation to concentration of cholesterol and blood groups.

Blood groups of Studied groups		Cholesterol (mmol/l)			Total
		<5.2	5.2-6.2	>6.2	
A-	Count % of Total	0 .0%	8 8.0%	3 3.0%	11 11.0%
A+	Count % of Total	10 10.0%	13 13.0%	10 10.0%	33 33.0%
AB-	Count % of Total	0 .0%	1 1.0%	0 .0%	1 1.0%
AB+	Count % of Total	3 3.0%	6 6.0%	2 2.0%	11 11.0%
B-	Count % of Total	0 .0%	2 2.0%	0 .0%	2 2.0%
B+	Count % of Total	7 7.0%	15 15.0%	6 6.0%	28 28.0%
O-	Count % of Total	0 .0%	0 .0%	2 2.0%	2 2.0%
O+	Count % of Total	3 3.0%	8 8.0%	1 1.0%	12 12.0%
<b>Total</b>	<b>Count % of Total</b>	<b>23 23.0%</b>	<b>53 53.0%</b>	<b>24 24.0%</b>	<b>100 100.0%</b>

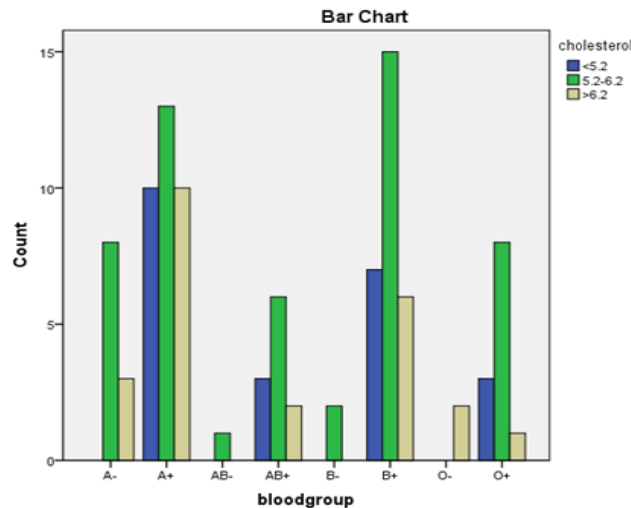


Figure (3) : Distribution of studied groups in relation to concentration of cholesterol and blood groups.

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Table and figure (3) appeared that concentration of cholesterol increased at the blood group A+(33%) , B+(28%) , O+(12%) and AB+(11%) compared with other blood groups this results agree with other studies who detected a greatly increased danger of occurrence coronary heart disease for accomplices with blood group A or B or AB, matched with those with blood group O. The tools responsible for causes relationship between "ABO blood group" and heart disease risk stay uncertain. On the other hand, numerous outlines of sign support its possible cardiovascular effects. "ABO blood group" have relationship with serum lipid levels; in general, the "A blood group" have observed to have " increased levels of serum total cholesterol" [15,16]. Recently, some genome-wide relationship studies observed that alternates at "ABO locus "was correlated to plasma lipid levels[17,18,6]

### Conclusions

The present study showed increase concentration of cholesterol at the age (50-59 and 60-70) years other than age groups and observed that increased the percentage of concentration of cholesterol in female (60%) more than male (40%). Also appeared that concentration of cholesterol increased at the blood group A+(33%) , B+(28%) , O+(12%) and AB+(11%) other than blood groups.

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