

Tikrit University

College of Nursing

Basic Nursing Sciences



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Bio Chemistry

Cholesterol

By: assistant lecturer

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Cholesterol, Triglycerides and Lipoproteins

Disorders of lipids are very important in medicine owing to their strong relations to many diseases, thus early detection of deranged blood lipid profile is important. The

“lipid profile” usually includes total cholesterol (TC), triglyceride (TG), and lipoproteins which can be classified into high density lipoprotein (HDL), low density lipoprotein (LDL) and very low density lipoprotein (VLDL).

Selection of patients for investigation

Plasma lipids should be measured in individuals with the following conditions:

- 1- Coronary heart disease (CHD), cerebrovascular disease and peripheral vascular disease.
- 2- A family history of premature CHD (occurring at age <60 years).
- 3- Other major risk factors for CHD (e.g. diabetes mellitus and hypertension).
- 4- Patients with clinical features of hyperlipidemia.
- 5- Patients whose plasma is seen to be lipemic.
- 6- To determine the relative risk of the development of acute pancreatitis attributable to hypertriglyceridemia.
- 7- To confirm that eruptive xanthoma, lipemia retinalis, and palmar xanthoma are the result of elevation of triglyceride-rich lipoproteins.
- 8- To determine whether secondary hypertriglyceridemia is produced as a side-effect

of certain drugs.

9- As a follow-up measurement to determine the effectiveness of diet, exercise, or lipid lowering drugs.

Important considerations

Age: cholesterol levels increase with age.

Sex: women have lower level LDL and total cholesterol than men except after menopause. Men had higher triglycerides and total cholesterol and lower HDL levels

compared to women.

At midcycle, the time of maximum estrogen secretion the plasma cholesterol and TG tend to be highest.

Orally administered estrogen reduces LDL cholesterol levels and increases HDL cholesterol levels in postmenopausal women.

Pregnancy increases total cholesterol, LDL cholesterol, HDL cholesterol and

Total Cholesterol

- Normal or desirable value: < 200 mg/dL (< 5.18 mmol/L SI units)
- Border line high value: 200 - 239 mg/dL (5.18 - 6.19 mmol/L SI units)
- High value: > 239 mg/dL (> 6.20 mmol/L SI units)

Specimen

- Fasting is required, the patient is instructed to fast 12-14 hours before testing.

Only

water is permitted also no alcohol should be taken 24 hours before test. Total

cholesterol, the HDL cholesterol concentrations change very little between fasting

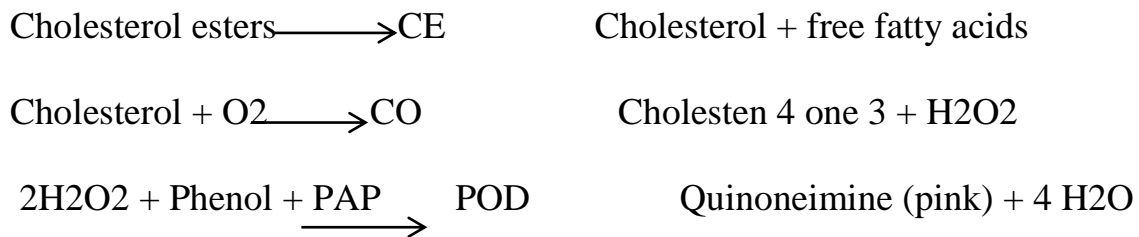
and non-fasting conditions.

- Usually serum used in analysis, obtained from venous blood. The serum total cholesterol measurement depends on colorimetric enzymatic methods by spectrophotometry which have become the most popular methods for its analysis.

Determination of cholesterol level in serum

PRINCIPLE

Enzymatic method described by Allain and al., which reaction scheme is as follows:



PROCEDURE

Manual method:

Let stand reagent and specimens at room temperature.

Pipette into well identified test tubes:	Blank	Standard	Assay
Reagent	1 mL	1 mL	1 mL
Demineralised water	10 µL		
Standard		10 µL	

Specimen			10 μ L
<p>Mix. Let stand for 5 minutes at 37°C or 10 minutes at room temperature.</p> <p>Record absorbance at 500 nm (480-520) against reagent blank.</p> <p>Reaction is stable for 1 hour.</p>			

Note: Specific procedures are available upon request for automated instruments.

Please contact BIOLABO technical support.

CALCULATIO

$$\text{Result} = \frac{\text{Abs (Assay)}}{\text{Abs(Standard)}} \times \text{Standard concentration}$$