

# Determination of Cholesterol

Cholesterol is a waxy fat like substance that is important for normal body function, It is used for cellular function and production of steroids . The body in most cases produce enough cholesterol to maintain normal body need . The liver is the major production factory for cholesterol ( about 70 %) . Diets high in saturated fats increase the amount of cholesterol in the blood stream . Brain tissues contain 2% from cholesterol and adrenal gland contain 6% from cholesterol .

Primarily , the blood cholesterol level (as that of any other lipid) reflects the lipoprotein . Cholesterol is the end product of (acetyl Co A) catabolism . It is secretion by oxidation to bile acids in the liver. Serum or plasma contain 2/3 cholesterol ester and 1/3 free cholesterol .

## Principle :-

Determine of cholesterol by cholesterol oxidation in enzymatic method. There are three steps for these reaction that allows for quantitation of cholesterol esters as well as free Cholesterol :-

1. Cholesterol ester  $\xrightarrow{\text{cholesterol esterase}}$  Cholesterol + Fatty acids .
2. Cholesterol + O<sub>2</sub>  $\xrightarrow{\text{cholesterol oxidase}}$  Cholest - 4 - 3 - one + H<sub>2</sub>O<sub>2</sub>
3. H<sub>2</sub>O<sub>2</sub> + 4 - amino anti pyrine + Phenol  $\xrightarrow{\text{peroxidase}}$  Quinonemine + H<sub>2</sub>O.

Other methods to determine of cholesterol (Liebermann-Burchard) , It is depend on extraction of cholesterol by mixture from isopropyl alcohol and ether or alcohol + acetone .

Ester cholesterol + Free cholesterol = Total cholesterol .

## Clinical Significant :-

### Hyper Cholesterolimia :-

1. Nephrotic syndrome (600 - 700) mg/dL .

2. Hypothyroidism ( myxedema ) (500 – 700) mg/dL .
3. Diabetes mellitus (400 – 500) mg/dL .
4. Obstructive jaundice .
5. Cirrhosis (1000 – 2000) mg/dL .

**Hypo Cholesterolimia :-**

1. Hyper throidism .
2. Low absorption of lipid from intestinal .
3. Severe inflammation of liver .
4. Wolf or starvation .

**Normal value :-**

At birth to one month (45 – 100) mg/dL .

In adults (150 – 250) mg/dL .

This value changing with sex and diet .