



A MINI-REVIEW ON HYPERLIPIDEMIA: COMMON CLINICAL COMPLICATION

General Medicine

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ABSTRACT

Cholesterol is a waxy substance produced by the body and is also obtained from the diet. A high cholesterol level in the body is commonly known as Hyperlipidemia. It is a common problem where there accumulation of extra fats in the blood. Hyperlipidemia is one of the major risk factor for cardiovascular diseases. Cholesterol and triglycerides together obstruct the blood flow by narrowing the Blood vessels. This review primarily focuses on the Causes, Types, Diagnosis, Symptoms and Treatment of Hyperlipidemia. It may be treated by modifying the life style, eating healthy food, reducing weight if obese, doing exercise on a regular basis but several medications are also available in the market.

KEYWORDS

Hyperlipidemia; Cholesterol; HDL; LDL; Triglycerides; Atherosclerosis

INTRODUCTION

Human body requires cholesterol which is involved in building the membrane of the cells and hormones like estrogen [1]. Liver is responsible for regulating the content of cholesterol in the blood stream. Approximately 80% of cholesterol in the body is produced by the liver whereas rest of the cholesterol is derived from the food like meat, fish, eggs etc. [2]. After having a meal, cholesterol is digested and absorbed in the small intestine later the metabolism and storage occurs in the liver. The cholesterol may be produced by the liver whenever there is a need for cholesterol in the body [3]. Cholesterol is not present in the food which is obtained from the plants [4].

Cholesterol and various other fats together deposit inside the arteries making them harder and narrower by which blood cannot pass easily through it and the pressure may be elevated resulting in high blood pressure [5]. The deposition of cholesterol may result in blood clotting. If the clot breaks down and flows through the blood towards the heart then it may leads to heart attack and if it enters the brain then it may increase the risk of stroke [6]. The primary etiology of elevated cholesterol in the blood is high intake of several saturated fats [7]. Cholesterol is bounded (or) carried by the lipoproteins (lipo=fat) as it cannot travel freely in the blood [8].

LITERATURE REVIEW

Basically Lipoproteins are categorized into three types [9]:

HDL (High Density Lipoprotein)

LDL (Low Density Lipoprotein)

VLDL (Very Low Density Lipoprotein)

High-density lipoprotein (HDL) levels are a strong, independent inverse predictor of cardiovascular disease [10-12]. HDL may be protective against heart disease, stroke etc and thus considered to be "good cholesterol" [13-14]. The lower level of cholesterol and higher level of protein may leads to HDL [15].

Low Density Lipoproteins (LDL) is thought to be as the "bad cholesterol" due to the higher cholesterol to protein ratio and this elevated level may increase the risk of causing heart disease, stroke, etc. [16]. Sometimes the artery becomes harder and narrower due to deposit (or) buildup of Plaque along the walls of artery leading to decreased flow of blood to the organs in the body [17]. Blood flow may be restricted by plaque rupture as it may cause clotting of blood which may result in heart attack or myocardial infarction [18].

Very Low Density Lipoproteins (VLDL) are associated with plaque deposits and constitute even less protein than LDL [19]. Basically Triglycerides are those types of fat which involves the low level of HDL and high level of LDL with the elevated level of cholesterol [20]. The blood test reports the total cholesterol score by the sum of HDL, LDL and triglycerides [21]. A high score indicates higher risk of several heart diseases [22-23] (Table 1).

Table 1: Effects of the level of cholesterol [23].

Total level of cholesterol	Category
Less than 190 mg/dl	Desirable
200-240 mg/dl	Borderline
Above 240 mg/dl	High
LDL (Bad) level of cholesterol	LDL category
Less than 98 mg/dl	Optimal
98-130 mg/dl	Above optimal
131-159 mg/dl	Borderline
160-190 mg/dl	High
Above 190 mg/dl	Very high
HDL (Good) level of cholesterol	HDL category
Less than 39 mg/dl	Major risk for heart
39-59 mg/dl	Better
Above 60 mg/dl	Protective against heart disease

TYPES OF HYPERLIPIDEMIA

Hyperlipidemia has different effects on the body and is divided into the following types [24]:

Type I Hyperlipidemia:

This type of Hyperlipidemia is most commonly seen in children [25]. It may cause infections in enlargement of liver, pancreas and may also cause abdominal pain. This is known as Lipoprotein lipase [LPL] deficiency, a hereditary pathological condition which may destruct the breakdown of fats [26].

Type II Hyperlipidemia:

This type of Hyperlipidemia is characterized by high level of LDL which may deposits fat around the eyes [27, 28].

Type III Hyperlipidemia:

This type of Hyperlipidemia predominantly affects the level of lipoproteins [29]. The level of LDL is low and the level of HDL is normal [30]. It may cause yellowish grey colour plaques around the eyes. It increases the risk of early onset of cardiovascular disease [31].

Type IV Hyperlipidemia:

In this type of Hyperlipidemia, the cholesterol level is decreased whereas the level of triglycerides is elevated which may leads to obesity [32].

All these types of Hyperlipidemia may be controlled by diet [33].

ETIOLOGY

Cholesterol, Saturated fat, Trans fat in the following foods may elevate the levels of lipid in the blood:

- Dairy products.
- Ice cream pastries.
- Fried and junk foods.
- Fatty and Oily foods.
- Meat etc. [34].

- **Several other causes of Hyperlipidemia**
- Genetic or inheritance.
- Obesity.
- Smoking.
- Several drugs such as corticosteroids, estrogen, beta blockers may cause
- Hypertriglyceridemia.
- Alcohol, Hypothyroidism, Kidney failure etc.
- Doing excessive exercise daily [35].

SYMPTOMS:

- If Hyperlipidemia results in [atherosclerosis](#) then the risk of occurrence of chest pain
- (Angina), heart attack (or) stroke may increase in the body [36].
- When the Cholesterol level increases it may also get deposited under the eyes [37].
- Increased levels of Triglycerides may lead to the formation of Nodules on the knees [38].
- Liver and pancreas may get enlarged.
- Blood Vessels of Heart and Brain may get blocked [39].

DIAGNOSIS

Hyperlipidemia may be diagnosed by a regular checkup of Sugar and Protein in the blood, certain blood tests, Lipid profile to determine LDL, HDL, VLDL, Total cholesterol and Triglycerides in the blood [40].

TREATMENT

The following modifications in the lifestyle may lower the cholesterol level:

- Proper diet.
- Maintain ideal body weight.
- Doing exercise on a regular basis.
- Having non-oily / non-fatty food.
- Eat Apples, Pears, Bananas etc.
- Having fish twice a week.
- Medications like Fibrates (Fenofibrate), Statins (Atorvastatin) may lower the triglyceride
- levels [41].
- Maximum time the lifelong therapy and medications are required [42].

CONCLUSION

Hyperlipidemia (or) Hypercholesterolemia should be cured as its elevated levels may result in several harmful Pathological conditions like Atherosclerosis, Cardiovascular diseases, High Blood Pressure, Cerebrovascular diseases and many other severe complications that seriously affect the human body.

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