Introduction

Fats are compounds of hydrogen and carbon. They differ from carbohydrates in that their molecules contain less oxygen than carbohydrates. Therefore, their oxidation is faster than carbohydrates, and they release more energy than those compounds.(1)

Fats have two sources: animal fats and vegetable fats. From a nutritional standpoint, fats are one of the groups that contain the most calories. (1)

It was previously believed that all types of fats are harmful to health, but after all food sources of fats were studied, it was discovered that there are healthy fats and harmful fats: (2)

- Healthy unsaturated fats are one of the main nutrients that the body needs for its general health, immunity, brain health, and to reduce cholesterol levels.
- Harmful fats: Reducing them significantly may protect many people from heart disease, obesity, diabetes, and some cancers.

High blood fats may lead to a number of diseases in the long term, the most important of which are the following: (3)

- Chest pain: The patient may experience chest pain as a result of angina when the arteries become clogged, causing reduced blood flow to the heart.
- Coronary artery disease: Coronary artery disease is a common type of heart disease that can lead to a heart attack.
- Having a heart attack: High levels of fat in the blood can cause a heart attack, which is often the result of coronary artery disease, or complete blockage of the arteries with fat and deposits, preventing all blood flow to the heart.
- Peripheral arterial disease.
- Blood clots.

- Stroke: When blood clots form, they can block blood flow to the brain, leading to a stroke.

Cigarette smoking is one of the most important modifiable risk factor for atherosclerosis and increasing morbidity and mortality of Chronic Heart Diseases (CHD).(4,5)

Cigarette smoking is widely known to be associated with CVDs. Hypertension, raises the risk of MI, cerebrovascular accidents, renal failure and other disorders dramatically. Hypertension affects an estimated 1.13 billion individuals globally, with two-thirds of them residing in low-income and middle-income nations.It is well known that cigarette smoking increases blood pressure (BP), and is associated with CVDs. However, some studies have concluded that smoking has no impact on hypertension, or that the chronic effect of smoking on BP is minor. Another review research found that smoking produces acute hypertension owing to sympathetic nerve activation, but the long-term effect is unclear because quitting smoking does not result in a substantial decrease in BP. However, the effect of smoking on BP needs to be re-evaluated as the current evidence is contradictory. Cigarette smoking has another negative impact on lipid profile (LP) levels of blood. Nicotine has a significantly negative effect on lipid metabolism and regulation. Smoking-induced lipid and lipoprotein abnormalities are hypothesised to have an influence on smoking-induced atherosclerosis. Scientists have discovered that smoking produces considerably higher levels of total cholesterol (TC), triglyceride (TG), low-density lipoprotein cholesterol (LDL-C) and lower levels of high-density lipoprotein cholesterol (HDL-C). The alterations mentioned above are linked to an increased risk of CVD. However, the details related to the very LDL-C (VLDL) and TC/HDL ratio are poorly addressed.(6)

Plasma lipoprotein abnormalities are said to be the underlying major risk factors and may even be essential for the common occurrence of atherosclerotic vascular diseases. (7)

Smoking has also been shown to be associated with insulin resistance in both non-diabetic and Type 2 diabetic subjects, with impaired oral fat tolerance, impaired intravascular lipolysis and dyslipidemia; these patients are characterized by an atherogenic lipoprotein phenotype, with increased triglyceride (TG) and low high density lipoprotein cholesterol (HDL-C) concentrations, and high levels of low density lipoprotein cholesterol (LDL-C)

Whether smokers have worse lipid profiles than non-smokers is controversial. A meta-analysis of 54 cross-sectional studies with respect to the association of

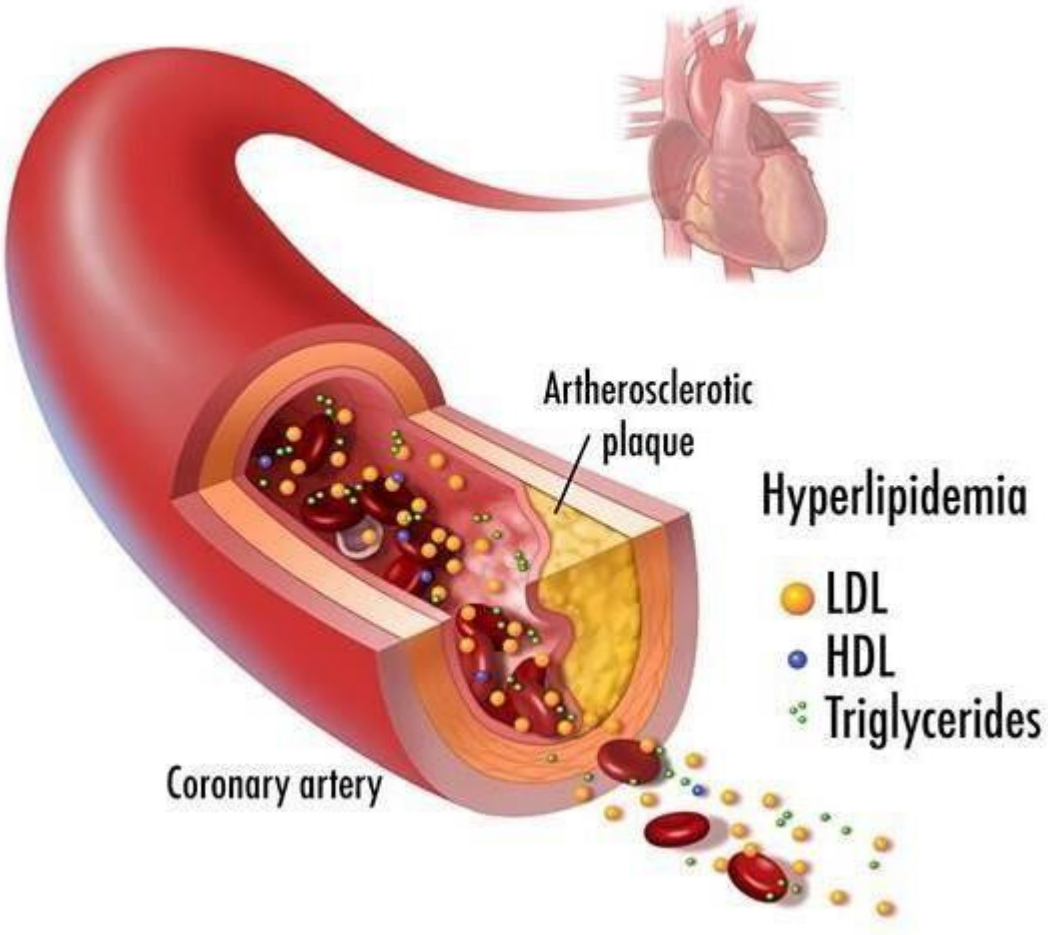
lipid profiles and cigarette smoking status revealed that smokers had higher serum concentrations of total cholesterol (TC) (3.0%), TG (9.1%), very-low-density lipoprotein cholesterol (10.4%), and LDL-C (1.7%), and lower serum concentrations of HDL-C (5.7%) and apolipoprotein A1 (4.2%) than nonsmokers. In addition, a meta-an-alysis of 27 prospective studies, on the effects of smoking cessation on lipid profiles revealed that smoking cessation significantly increased the level of HDL-C but not of TC, LDL-C, or TG. However, there is limited information available regarding the effect of smoking cessation on blood glucose control and lipid profiles. Therefore, the changes in blood glucose control, lipid profiles, and insulin resistance-associated hormones both before and after 2-months of smoking cessation in Korean male smokers were examined.(8)

There are also types of fats:

LDL cholesterol consists mainly of a cholesterol center surrounded by a layer of lipoproteins, which carry cholesterol and transport it through the blood.(9)

HDL It is one of the types of cholesterol that plays a role in protecting against heart disease, as it helps eliminate other harmful types of cholesterol from the blood and prevents them from accumulating inside the arteries, so it is known as

good or beneficial cholesterol.(10)



Triglycerides are a type of fat found in the body and a source of energy in the body.(11)

Literature review

Lipids

They are compounds of hydrogen and carbon. They differ from carbohydrates in that their molecules contain less oxygen than carbohydrates. Therefore, their oxidation is faster than carbohydrates, and they release more energy than those compounds.(12)

Lipid Profile :(29)

1-Low-density lipoprotein (LDL)

2-High-density lipoprotein (HDL)

3-Total triglycerides

4-Total cholesterol

5-Very low-density lipoprotein (VLDL)

1-Diagnosis of high harmful cholesterol

High harmful cholesterol is diagnosed based on its percentage in the blood. The lower the harmful cholesterol value, the better. The values indicate the following:(30,31)

1-Less than 100 mg/dL: optimal value.

2-100-129 mg/dL: close to normal.

3-130-159 mg/dL: evidence of high risk.

4-160-189 mg/dL: high.

5-190 mg/dL: Very high.

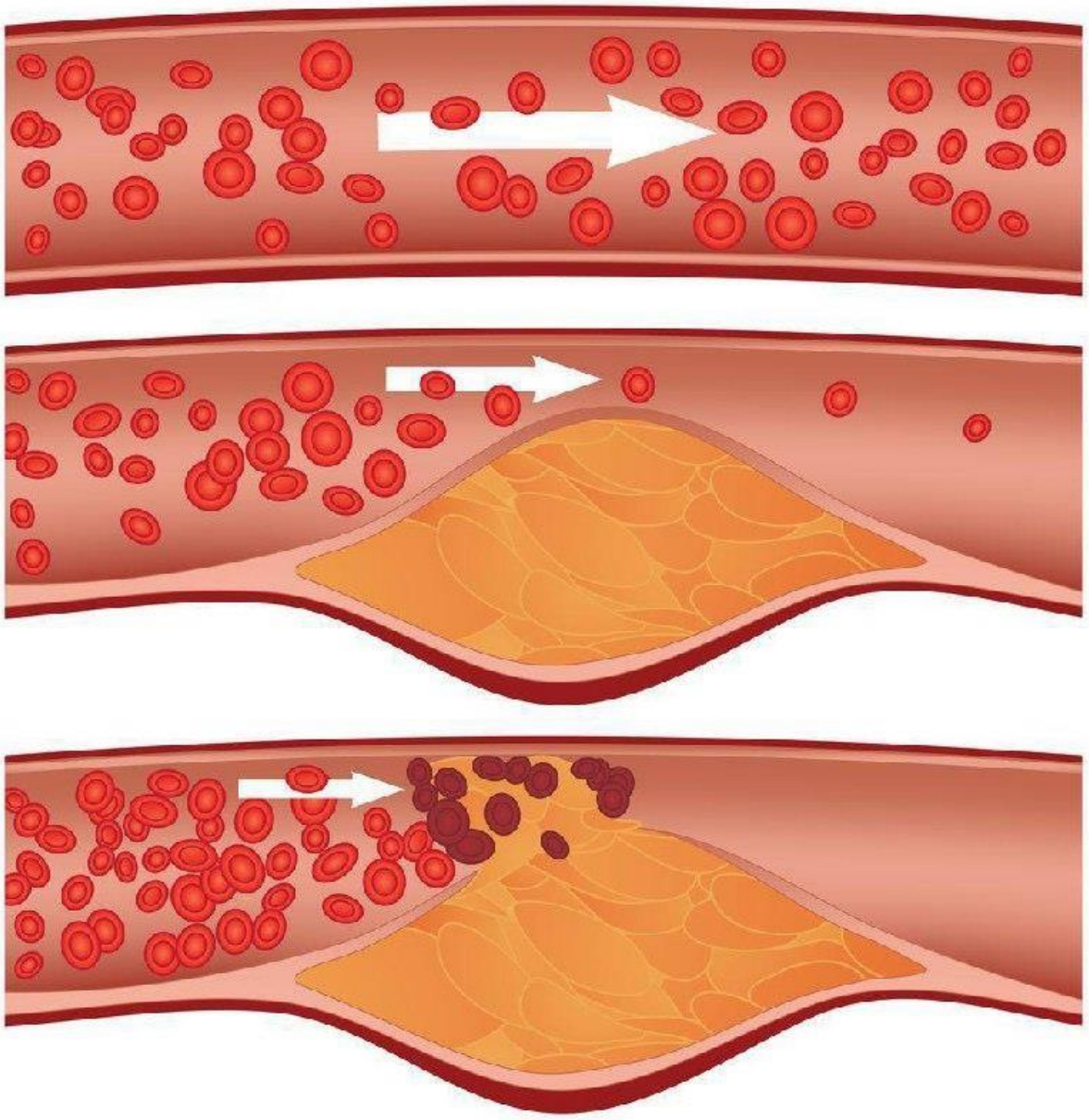
2-Good cholesterol is scientifically known as high-density lipoprotein, and it is called good or beneficial cholesterol because it transports cholesterol from the bloodstream to the liver, where it is eliminated. The risk of heart disease

increases if the level of this protein falls below 40 mg. \dl for men and less than 50 mg\dl for women.(32)

3-The normal range for triglycerides: less than 150 mg/dL. The upper limit for triglycerides: between 150 to 190 mg/dL.(33)

4-Normal values: These represent total cholesterol values that are less than 200 mg/dL. These are the desirable values and reflect a low risk of heart disease.(34)

5-Less than 30.(35)



However, high levels of LDL-C are accompanied by the leakage of amounts of cholesterol into the lining of blood vessels, the occurrence of atherosclerosis in them, and the occurrence of damage to the arteries of the heart and arteries of the brain, which in turn increases the risk of cardiovascular diseases and strokes, hence the name “bad cholesterol.(36)

(12)

(13)

Functions of fat in the body:(13,14)

• Providing energy to the body: Although carbohydrates are the body's source of fuel, the body converts fats into a source of energy support when carbohydrates are not available, and fats are a concentrated source of energy.

Every 1 gram of fat contains 9 calories, which is twice the amount of calories found in protein or carbohydrates.

• Regulating body temperature: Fat cells insulate the body to maintain its temperature.

• Building cells: Fats are one of the basic units needed to build cells.

• Protecting the physical organs: The fat stored in the body surrounds the internal organs and protects them from the effects of sudden movements and external shocks.

• Helping in the absorption of vitamins from food: Some types of vitamins depend on fats for absorption, as they are fat-soluble vitamins, and they are vitamin A, vitamin D, vitamin E, and vitamin K. If the body does not obtain sufficient amounts of fat as a result of a low-fat diet, it may limit This is due to the absorption of these vitamins, and thus their levels in the body will decrease.

• Hormone formation: Fats are structural elements of some important substances in the body, including prostaglandins, which are substances similar to hormones that regulate many bodily functions. The body also needs fats to regulate the production of sex hormones, and this explains the reason behind delayed puberty and failure to occur. Menstruation in some very thin teenage girls.

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Smoking

Smoking causes heart disease, high blood pressure, atherosclerosis, peripheral vascular disease, gum disease, chronic obstructive pulmonary disease (emphysema, chronic bronchitis), heart attacks, strokes, lung cancer, and laryngeal cancer. The effect depends on the number of years the smoker has smoked and the amount of tobacco. Not only smokers but also people who are exposed to secondhand tobacco smoke are vulnerable to health damage.(19)

In the twentieth century, 100 million people died as a result of smoking, making smoking the largest cause of death in the world.(20)

Smoking is one of the most common manifestations of recreational drug use. Nowadays, tobacco smoking is the most common form of smoking, practiced by 1.3 billion people, more than 80% of whom live in low- and middle-income countries.(21)

According to the World Health Organization, smoking is one of the greatest public health threats the world has witnessed throughout history, as it kills more than 8 million people every year, including 1.2 million deaths among non-smokers who are exposed to secondhand cigarette smoke.(22)

In 2020, 22.3% of the world's population, 36.7% of men and 7.8% of women, used tobacco.(22)

Tobacco components

Tobacco products are made by adding a lot of chemicals to improve the taste and increase pleasure while using them. It is worth noting: The combustion process of a cigarette produces thousands of chemicals, including at least seventy types of carcinogens, and it has been found that smoking tobacco can cause some serious health problems, including heart and lung diseases.(23)

The most prominent harmful chemicals produced from tobacco smoking are:(23,24)

• Nicotine: The main substance that causes addiction and motivates the smoker to continue smoking.

• Tar: Solid particles suspended in tobacco smoke, which contain carcinogenic chemicals. Tar is characterized by its viscosity and brown color, which causes discoloration of teeth, nails, and lung tissue.

• Carbon monoxide: A poisonous, odorless, colorless gas that replaces oxygen when it enters the body, which impedes the delivery of oxygen to the body's organs and cells, and leads to death if too much of it is inhaled.

• Metals: Tobacco smoke contains many carcinogenic metals, the most important of which are arsenic, beryllium, cadmium, chromium, cobalt, lead, and nickel.

• Radioactive elements: Tobacco contains carcinogenic radioactive elements, including uranium.

• Oxidizing chemicals: highly reactive chemicals that can damage the heart muscles and blood vessels of smokers; It interacts with cholesterol, leading to the accumulation of fatty substances on the walls of the arteries, which in turn increases the risk of cardiovascular disease and stroke.

• Other components: including:
o Hydrogen cyanide.
o Formaldehyde.
o Lead.
o ammonia.
o benzene.
o Polycyclic aromatic hydrocarbons

Harmful effects of tobacco smoking
Smoking tobacco involves many harms and negative side effects, the most notable of which are:

The effects of tobacco smoking on heart health

Nicotine causes blood vessels to narrow, which restricts blood flow, thus increasing the risk of many health conditions that affect the heart and blood vessels, including:(25)

• Peripheral Artery Disease (PAD).
• Atherosclerosis.
• Abdominal aortic aneurysm.
• Coronary heart disease, including heart attack and sudden cardiac death.
• brain attack.
• Hypertension.

The effects of tobacco smoking on diabetes
Smoking tobacco increases the risk of developing type 2 diabetes by a rate that may range between 30% - 40%, in addition to exacerbating some health conditions associated with type 1 diabetes, including kidney disease.(26)

How to quit smoking tobacco
The harms and negative side effects of tobacco smoking indicate the necessity of looking for effective ways to quit it. The following is a statement of the most prominent of these methods:

Use nicotine replacements
Using nicotine replacements is one of the effective ways to quit

smoking, and its forms include nicotine gum, nicotine patches, nasal sprays, inhalers, and lozenges. (27)

Take smoking cessation medications
Many medications help you quit smoking by curbing cravings and reducing withdrawal symptoms. (27)

Doing exercise

Maintaining physical activity through exercise such as walking and jogging helps curb nicotine cravings and relieve some withdrawal symptoms. (28)

Use of electronic cigarettes
E-cigarettes are used as an alternative to cigarettes and other tobacco products, and contain lower levels of nicotine and harmful chemicals. (24)

The relationship between lipds and smoking:

Smoking is a social habit that is linked to a group of serious and diverse diseases, such as atherosclerosis, cardiovascular disease, and various pathological mechanisms in the patient's body, such as injury and destruction of the lining of blood vessels, as it helps the accumulation of cholesterol on the walls of the .coronary artery, which leads to a heart attack
Coronary artery disease, which leads to a heart attack(37,38)

According to previous studies it has been shown
The HDL percentage and the LDL percentage have decreased
Smokers have increased blood fat levels in smokers compared to non-smokers, and thus smoking has affected atherosclerosis through blood fat levels.(39,40)

The results of many researchers have shown that smoking more than 14 cigarettes per day poses a major risk of disease
Coronary arteries.(41)

Previous studies have proven that acrolein and hydrogen peroxide are oxidants
The active ingredient found in cigarette smoke causes programmed cell death and necrosis, as well as causing damage
In the alveolar epithelial cells lining the walls of blood vessels.(42,43), Which leads to formation
The process of blood clotting begins almost immediately after it leads to damage .)to the endothelium layer (the endothelial membrane
lining the blood vessel wall. When the blood is exposed to certain proteins, such as tissue factor, it occurs
Some changes in platelets and one of the plasma proteins, which is fibrinogen, ...which represents one of the
Blood clotting factors, platelets then immediately work to form a platelet plug over an area
Blood vessel injury.(44)

Tobacco smoke contains many constituents, nicotine is one of the main constituents. Nicotine causes increase in triglyceride, cholesterol and VLDL levels and decrease in HDL levels, Augestin (45), later on Cluette Brown(46) ,also studied that long term consumption of oral nicotine increased LDL cholesterol and decreased HDL cholesterol. It has been described that nicotine increases the circulatory pool of atherogenic LDL via accelerated transfer of lipids from HDL and impaired clearance of LDL from plasma compartment therefore it increases the deposition of LDL cholesterol in the arterial wall, Honjack.(47)

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