



A Review on: Cardiovascular Disease Atherosclerosis

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Abstract: Coronary heart disease (CHD) is also known as Atherosclerosis. Is the primary cause of heart disease & stroke. In western countries 50% causes of death is due to heart disease. There are some environmental factors and genetic factors causes Atherosclerosis. In 1949 Atherosclerosis was added to “International classification of Diseases”. In United States about 1 in 4 death is due to heart disease. Atherosclerotic is a chronic inflammatory process which results in the formation of plaque in the artery which restricts blood flow and lead to thrombosis.

Keywords: Atherosclerosis, Inflammation, Coronary Heart Disease, Low Density Lipoproteins.

1. INTRODUCTION

Atherosclerosis is a disease that occurs when inside the arteries there is formation of plaque. Plaque are sticky substances it contains fats, cholesterol, calcium. Due to formation of plaque arteries get narrowed and hard .narrowing of arteries restrict the blood flow and lead to blood clots, stroke or heart attack.

Basic Mechanisms involved in Atherosclerosis

Atherosclerosis produces due to inflammation, oxidative stress and genetic predisposition. When in arteries imbalance of lipid metabolism occurs it leads to misconducted immune response and causes chronic inflammation of vascular.

Process of Atherosclerosis

There are three steps involved in Atherosclerosis

1. Formation of fatty streaks
2. Formation of atheroma
3. Formation of Atherosclerotic plaque



Arteries are blood vessels which carry oxygenated blood from heart to different part of body except pulmonary artery. There are three layers in arteries. Outer layer is called tunica externa, made up of fibrous connective tissue with collagen fibers. Middle layer is called tunica media which is made up of smooth muscle and elastic fibers. Inner layer is called tunica intima, made up of squamous epithelium.

Formation of fatty streaks:

Fatty streaks formation are the initial stage of Atherosclerosis, which is due to accumulation of lipid laden cells in the inner layer of artery. It appears as an irregular yellow white lumen. They can visible to the naked eye.

Fatty streaks form in four steps

- Low density lipoproteins cholesterol trapping
- Activation of endothelial cells
- Leukocytes activation
- Formation of foam cell

In normal conditions LDL in plasma and intracellular LDL concentrations are in equilibrium in arterial wall. LDL-C enter endothelial cell through the process of endocytosis. Increases in plasma lipid are trapped in intima due to trapping of LDL it increases the duration of stay in the lesion. It causes cell oxidation if trapped particles.

Oxidized LDL activates T cells and it work as antigen for T cells and it secret cytokines both cytokines and oxidase lipids activate the endothelial cells.

Activated endothelial cell produce adhesion of molecules on leukocytes. This adhesion molecules release the chemokines. Chemokine's are the proteins of low molecular weight which are attractant chemokines, which have major role on activation and migration of leukocytes. After activation of leukocytes foam cells are form.

Atheroma formation:

When damage to endothelial cell it allows the entry of cholesterol rich low density lipoproteins into the intima layer and diffuse the lipids. White blood cells called monocytes enter the artery wall, it transforms into macrophages. This macrophages take up oxidized LDL to form foam cells. When foam cell die, they release the cellular content to form extracellular lipid. smooth muscles cells moves to intima, producing collagens to stabilize the growing lesion.

Atherosclerotic plaque formation:

Plaque form due to accumulation of low density lipid in intima, oxidation of LDL, due to foam cell, formation of fibrous cap containing smooth muscle cells.

Risk factors in Atherosclerosis:

- High saturated fat in diet
- High cholesterol
- Hypertension
- Hyperlipidemia
- Diabetic



- Decreased HDL
- Increases homocysteine
- Smoking
- Obesity

Diagnosis of Atherosclerosis:

Electrocardiogram:

This test measure the electrical activity of heart.

Blood Tests:

Blood test check the level of certain proteins, sugar, fats, cholesterol in the blood that indicate heart condition

Ankle bronchial Index Test:

This test help to doctor to understand if there is decreased blood flow to lower legs and feet. In this test blood pressure cuffs are placed on the arms and ankles

CT scan:

CT scan is used to find calcium deposits in plaque of people with heart disease. They are effective way to spot Atherosclerosis before symptoms develop.

Angiogram:

This test can directly show blocked arteries. In this test a thin tube is put inside an artery in the leg or arm.

Coronary calcium scan:

It can show calcium deposits in the artery walls. Results of test are given as a score. When calcium is. Present the higher the score, the higher your risk of heart disease.

Treatment for Atherosclerosis:

Blood Thinner: doctor gives a blood thinner medication to reduce risk of platelet clumps.

Blood pressure: This type of medicine helps to prevent complication related to disease. Reduce the risk of heart attack.

Statins: stain are commonly prescribed to lower cholesterol, improve artery health and prevent atherosclerosis

Stop smoking: smoking damage your arteries.when you stop smoking it keeps your arteries healthy and prevent complication of Atherosclerosis.

Exercise: Regular exercise improves the blood flow, lower blood pressure and reduce risk condition that increases heart rate.

Eat healthy foods: A healthy diet can help you control your weight, blood pressure, cholesterol and blood sugar. A heart healthy diet contain fruit, vegetables and grains, low carbohydrate, sodium, sugar and saturated fats.



2. CONCLUSION

Atherosclerosis is major cause of cardiovascular disease. It's disease that causes millions of peoples in every year. It is the main cause of heart attack and results in death of many people everyday. Atherosclerosis not completely preventable but there risk factors that can eliminated easily.

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