

DIET AND HEART DISEASE

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AN AGE-OLD SAYING rates a man to be as old as his arteries. This probably reflects the early recognition of our ancestors of the relationship that exists between the condition of the arteries (blood vessels in man and his longevity).

Atherosclerosis

As years advance, degenerative changes occur in the arterial wall, ultimately leading to patches of deposits of certain lipid substances on the inner lining of the blood vessel, consequently there is a narrowing of the passage of the blood vessel. This disease process is known as atherosclerosis.

Predisposing Cause of Heart Disease

Atherosclerosis is held to be an important predisposing cause of coronary heart disease. In the developed countries of the West, this disease kills more adults than any other single disease. Even in the developing nations including India, the incidence of the disease is not inconsiderable, especially in the well-to-do segments of the population. Also, the disease seems to be moving down in the age-scale, affecting more and more young men. Women seem to be relatively spared at least until menopause.

The Cholesterol Theory

It is generally believed that the chief cause of atherosclerosis is a disturbance in the metabolism of fats and related substances, particularly "Cholesterol". It is thought that cholesterol and other fatty substances get deposited on the inner lining of the blood vessel by filtration as the blood flows through it and it has therefore, been postulated that higher the concentration of cholesterol in plasma, greater are the chances of its accumulation in the artery.

Atherosclerosis Leading to "Occlusion" and "Infarct"

The deposition of these fatty materials along with some other complex constituents in blood gradually narrow the diameter of the lumen of the blood vessel resulting in reduced supply of blood to the heart muscle, particularly during physical activity. In addition, it favours the formation of a blood clot resulting in occlusion (closing) of the vessel and cutting off blood supply to a vital portion of the heart and thus producing an infarct (the death of the tissue) which is in fact generally known as a heart attack.

Evidence Supporting the Cholesterol Theory

Many studies have demonstrated an association between high serum (blood) cholesterol levels and heart disease. The atheromatous lesion in man is known to contain large amounts of cholesterol and its esters with fatty acids. In diabetes, nephrosis and hypothyroidism, diseases in which blood cholesterol levels are high, the incidence of heart disease is also higher than in normal people. Atherosclerosis can be experimentally produced in many species of animals by inducing a sustained elevation of blood cholesterol levels by dietary or other means. Serum cholesterol levels are higher in groups of middle-aged men with clinical evidence of coronary heart disease than in control groups. Also, a significant correlation has been found between serum cholesterol levels in population groups of different nations on the one hand and the incidence rate of coronary heart disease on the other.

All these experimental and epidemiological studies have strengthened the concept of the association of elevated serum cholesterol levels with atherosclerosis and coronary heart disease.

Factors Influencing Serum Cholesterol

There are many factors which influence the level of serum cholesterol in man. Among them are diet and environment which operate on a basic genetic endowment. DIET is now recognised as a key factor though not an exclusive one in regulating serum cholesterol level in man.

Diet and Serum Cholesterol

In populations subsisting on high amounts of animal foods including dairy products, both the serum cholesterol levels and the incidence of heart disease are high, whereas in those whose habitual diets are predominantly of vegetable origin both these are low. Such differences have also been recorded between the well-to-do and the low-income population groups within the same country in whom there is a wide disparity in the diet. Similarly groups immigrant in more prosperous countries have higher serum cholesterol levels and higher incidence rates of heart disease than their cousins staying back in their original countries. These have been attributed to the striking change in the dietary pattern of the immigrants.

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