INDIVIDUAL RISK FACTORS FOR CARDIOVASCULAR DISEASE

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Four decades of epidemiologic research at the Framingham Study and elsewhere have identified host and environmental contributors to the major atherosclerotic cardiovascular diseases (17). These predisposing innate and modifiable acquired predisposing conditions have come to be known as "risk factors". This report is concerned with the major risk factors for atherosclerotic cardiovascular disease as discovered from prospective long-term epidemiologic investigation of cohorts of subjects such as those participating in the Framingham Study.

Atherosclerosis is a complex multifactorial process which involves lipid deposition, macrophages, blood pressure, rheology of blood flow, smooth muscle proliferation, inflammation, thrombogenesis, platelet aggregation, and insulin resistance among other factors. Hence, it is not surprising that multiple risk factors are involved which interact and promote accelerated atherogenesis and occlusive lesions precipitating catastrophic clinical events. The risk factor formulation of causation is that certain life styles promote atherogenic traits in genetically susceptible persons, leading to accelerated atherogenesis and eventually to a compromised arterial circulation.

For example, overeating and too little exercise leads to obesity which promotes development of multiple atherogenic traits and accelerated atherogenesis which eventually occludes the arterial circulation increasing the incidence of clinical cardiovascular events (19). A genetic tendency to abdominal patterns of acquired obesity appears to be particularly atherogenic (4,20).

The major identified risk factors are highly prevalent in the adult North American population and most tend to increase with advancing age. In
the contemporary (1983-1989) Framingham offspring study of subjects aged 30-69 years, blood lipid abnormalities were present in about 20% of men and women, obesity in 20-30%, smoking in 27% and hypertension in 10-20%. Thus, modifiable risk factors are rampant in the general population indicating a need to alter the ecology of the general population to one more favorable to cardiovascular health.

LIPIDS

It is acknowledged that blood lipids have a fundamental role in atherogenesis. Epidemiologic data now indicate that a proper evaluation of the atherogenic potential of the serum cholesterol requires knowledge of the lipid profile. The serum total cholesterol reflects a two-way traffic of cholesterol entering and leaving the tissues, including the arterial intima (10). This necessitates its partition into the atherogenic low density lipoprotein (LDL) and protective high density lipoprotein (HDL)-cholesterol components (Fig. 1). HDL-cholesterol must be taken into account as it greatly influences coronary heart disease risk at any serum total cholesterol value (Fig.2) (6).

Coronary Heart Disease
BY HDL AND LDL CHOLESTEROL
50 - 70 YEAR OLD MEN FRAMINGHAM STUDY

![Graph](image)