



Perspective of Cardiometabolic Diseases

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Abstract

A class of disorders known as cardiometabolic diseases includes heart attack, stroke, diabetes, insulin resistance, and non-alcoholic fatty liver disease. These conditions are all common yet frequently preventable. People around the world are becoming more likely to develop one or more of these illnesses at some point in their lives. The four main causes of this increase are acknowledged to be smoking, not exercising enough, consuming large amounts of alcohol, and maintaining an unhealthy diet. Tackling cardiometabolic disorders is crucial for the future health of our entire communities because of the enormous socioeconomic costs associated with these conditions.

Keywords: Perspective; Cardiometabolic Diseases; Heart Attack; Stroke; Diabetes; Insulin Resistance

Introduction

Cardiometabolic diseases is a combination of metabolic dysfunctions mainly characterized by insulin resistance, poor glucose tolerance, dyslipidemia, hypertension, and central obesity [1].

In developed world, cardiometabolic disorders constitute the primary cause of death, and their prevalence is sharply rising in low- and middle-income nations. Cardiometabolic diseases are usually avoidable by leading a healthy lifestyle that includes enough exercise, moderate alcohol use, and a nutritious food [2].

Cardiometabolic diseases encompass conditions that affect the heart and blood arteries, such as coronary heart disease, stroke, and heart failure. Along with this, it also includes illnesses like diabetes, kidney disease, and non-alcoholic fatty liver disease. Atherosclerosis, thrombosis, inflammation, and endothelial dysfunction are the pathophysiological processes that underlie these condi-

tions. Elevated blood pressure, an atherogenic blood lipid profile, and poor glucose tolerance are examples of biological risk factors that can be changed [3].

The impact of nutrients, foods, dietary habits, and other lifestyle factors on established and new risk factors as well as the underlying pathophysiological mechanisms for cardiometabolic disorders [4].

The management of cardiometabolic disorders risk factors is fraught with difficulties. However, there are treatment approaches and cardiometabolic programs that combine dietary and exercise recommendations and emphasize behavioral change in order to reduce cardiometabolic risk factors as effectively as possible. Specific dietary advice, nutritional guidelines, and continuing cognitive and psychological evaluations of habits and bad behaviors are all part of these programs [4].

Pathophysiology

Indeed, the risk of myocardial infarction has been linked to a number of pathologic cardiometabolic variables. An imbalance between energy intake and expenditure leads to visceral fat. It is a metabolically active tissue that releases several cytokines that are pro-inflammatory and pro-thrombotic. Both visceral adipose tissue and fatty liver are associated with cardiometabolic disorders, but the visceral adipose tissue relationship is stronger. Waist circumference has been shown to be a more accurate indicator for predicting cardiac risk than body mass index [5].

The formation and progression of cardiometabolic disorders have been linked to changes in the number or density of mitochondria and their oxidative mechanism. Additionally, it has been noted that impaired oxidative metabolism may contribute to the accumulation of visceral fat and the emergence of insulin resistance [3].

Similarly, insulin resistance in adolescents appears to be linked to a decline in the proportion of mitochondrial to nuclear DNA. Furthermore, for neonates of gestational age, metabolic syndrome-related disorders in the mother lead to a lower ratio of mitochondrial to nuclear DNA in the child's adult life [6].

It has been demonstrated that the fat protein adiponectin, which comes from adipose tissue, has cardioprotective properties. Its anti-inflammatory and antiatherogenic qualities have been verified noted. Patients with diabetes, dyslipidemia, and obesity have been reported to have low levels of adiponectin; as a result, the notion that hypoadiponectinemia may explain the pathophysiology of cardiometabolic disorders has been put up [7].

Due to a decrease in the amount of glucose that is transported into the muscles, excessive release of free fatty acids from adipose tissue is also linked to insulin resistance. It is of importance to note that cardiometabolic disorders therapeutic options may include lowering plasma levels of free fatty acids [8].

The link between insulin resistance and hypertension is one of the most well-established cardiometabolic disease risk factors. There are several suggested mechanisms. First of all, when administered intravenously to individuals of normal weight, insulin is a vasodilator with subsequent effects on sodium reabsorption in the kidney. While the renal effect on sodium reabsorption is sustained in the presence of insulin resistance, the vasodilatory effects of insulin may be lost. The development of hypertension, a risk factor for cardiometabolic disease, and increased sympathetic nervous system activity may be caused by hyperinsulinemia [9].

However, identifying the pathophysiology of cardiometabolic disease will aid in creating an effective therapy plan. Research on managing each distinct aspect of this condition to lower cardiovascular morbidity and mortality is continuing. The current method of treating cardiometabolic disease includes active management of the traditional risk factors, such as smoking, diabetes, hypertension, and dyslipidemia. However, cluster risk factors such as high plasma insulin, intra-abdominal obesity, and prothrombotic and proinflammatory cytokines need to be addressed on a therapeutic level [10].

Diet and exercise and its impact

Cardiovascular risk can be reduced by some therapeutic methods such as moderate physical activity, weight loss, strict blood pressure management, dyslipidemia correction, and glycemic control. It is believed that engaging in at least 30 minutes per day of moderate-intensity exercise, such as rapid walking, will lessen the frequency or severity of cardiometabolic disease. It has been demonstrated that individuals with CMS who regularly exercise as part of cardiorespiratory fitness programs tend to have lower risks for all-cause death [11].

Furthermore, regular exercise have demonstrated more favorable effects in reducing the development of diabetes mellitus. Additionally, the goal of treatment plans should be to lower LDL cholesterol first, followed by decreasing triglyceride levels to less than 150 mg/dL [12].

Numerous powerful groups that care about diabetes have advocated using weight-loss surgery in the clinical management of type 2 diabetes in significantly obese people. It has still to be identified at what point in the diabetic course the use of such surgery would have the best risk-benefit ratio.

In order to prevent clinical worsening, some doctors advise using surgery relatively early in the course of the disease. Others advise delaying surgery unless a patient's condition cannot be successfully controlled by medication. The clinical course of type 2 diabetes seems to gain less from surgery when it is saved for more advanced and complex phases, and it also runs the danger of subjecting these more fragile individuals to the potential negative effects of a quick weight reduction.

It might be difficult to implement an effective obesity control approach, but it is now widely accepted that behavioral change, dietary macronutrient composition, and physical activity are the

three main factors that influence cardiometabolic disease management.

In conclusion, Obesity, dyslipidemia, hyperglycemia, and hypertension all contribute to cardiometabolic disease, which raises the risk of type 2 diabetes and cardiovascular disease. As the population becomes more obese, the prevalence of this prevalent metabolic condition rises. With the aim of lowering the risk of cardiovascular disease and type 2 diabetes mellitus, cardiometabolic disease was created as a diagnostic category to identify people who may react to dietary and lifestyle adjustments as well as medication treatment when necessary.

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