

Confronting Chronic Disease in the Community

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ABSTRACT

Cardiovascular diseases are the most prevalent cause of illness and mortality among patients with Type 1 or Type 2 diabetes. The proposed mechanisms that can link enhanced atherosclerosis and increased cardiovascular risk in our society are poorly understood. It has been suggested that an association between hypo/hyper glycemia and intracellular metabolic changes can result in oxidative stress (a disturbance in the balance between the production of reactive oxygen species (free radicals) and antioxidant defenses, is discussed in relation to its possible role in the production of tissue damage in diabetes mellitus), low-grade inflammation, and endothelial dysfunction (in which the endothelial layer of the small arteries fails to perform all of its important functions normally. As a result, several bad things can happen to the tissues supplied by those arteries). The impact of clinical factors that may coexist with diabetes such as obesity, dyslipidemia, and hypertension are also discussed.

Keywords: Obesity; Dyslipidemia; Hypertension, Type 1 or Type 2 diabetes

INTRODUCTION

Diabetes is an important chronic disease which incidence is globally increasing and though considered as an epidemic. Individuals with diabetes and with chronically poor metabolic control can experience micro-vascular and macro-vascular complications. Cardiovascular Diseases (CVD) are the most prevalent cause of mortality and morbidity among people with T2D and T1D. Adult people with diabetes present rates of mortality due to heart disease and stroke from two to four times higher than those without diabetes (Figure 1).

Pathogenesis of cardiovascular disease in diabetes. The mechanisms involved in the pathogenesis of cardiovascular disease in diabetes comprehend epigenetic changes and intracellular metabolic changes that result in oxidative stress, low-grade inflammation, and endothelial dysfunction. CRP: C-reactive protein; FFA: free fatty acids; INOS: inducible nitric oxide synthase; IL-1: interleukin 1; IL-6: interleukin 6; MCP-1: monocyte chemo attractant molecule 1; MMP: matrix metalloproteinase; NF- κ B: nuclear factor kappa- β ; PAI-1: plasminogen activator inhibitor-1; VCAM-1; vascular cell adhesion molecule-1; VEGF: vascular endothelial growth factor; TNF- α : Tumor necrosis factor- α ; INF- γ : Interferon- γ .

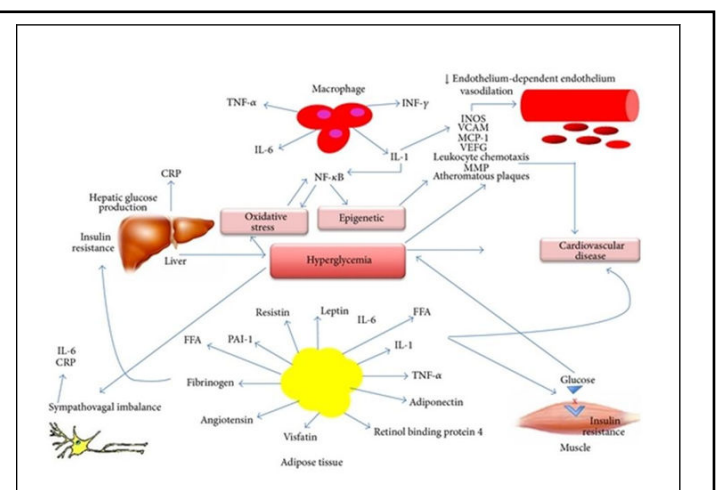


Figure 1: The mechanisms involved in the pathogenesis of cardiovascular disease in diabetes.

Obesity

Obesity, which prevalence is also increasing worldwide is becoming a major public health issue due to its association with chronic diseases such as diabetes mellitus, hypertension, dyslipidemia, sleep apnea, osteoarticular disease, and cardio and

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cerebrovascular diseases. Obesity, especially with visceral fat deposition, is associated with low-grade inflammation, which plays a role in the pathogenesis of diabetes, and both diseases are associated with significant increase in morbidity and mortality due to cardiovascular disease.

Dyslipidemia

Dyslipidemia in T2D worsens cardiovascular risk due to the peculiar atherogenic profile composed by increased Very Low-Density Lipoprotein (VLDL) cholesterol, triglycerides and small and dense LDL cholesterol levels and decreased High-Density Lipoprotein (HDL) cholesterol levels.

Hypertension

Hypertension is a highly prevalent disease worldwide and very common among patients with diabetes. Approximately from 10 to 30% of T1D and 60% of T2D (According to sources) patients have hypertension. The coexistence of these two conditions increases the risk of developing macro-vascular complications (myocardial infarction, stroke) and also micro-vascular complications.

Oxidative stress

Increased intracellular glucose concentrations result in the activation of alternative pathways of metabolism such as the hexosamine and the aldose reductase pathways, both involved in the pathophysiology of chronic complications of diabetes.

CONCLUSIONS

The incidence of diabetes is sharply increasing worldwide which represents an important burden for patients and for the society as well due to micro- and macro vascular complications that people with this condition may experience and consequently cardiovascular diseases that are the most prevalent causes of morbidity and mortality among patients with diabetes. The classical risk factors for the development of cardiovascular disease in subjects with diabetes are the presence of poor glycemic control, obesity, dyslipidemia, and hypertension. In recent decades, several clinical trials have investigated the effect of intensive treatment of hyperglycemia on cardiovascular risk reduction, in both T1D and T2D.

Assessment of behavioral changes and lifestyle modification

The population knowledge, perception and awareness of the impact of cardiovascular risk factors on their global health, are essential components of behavioral changes and lifestyle modification. The lack of knowledge, misconceptions, and the poor level of risk factor control are attributed to ineffective prevention programs. In most of countries, diverse prevention programs and health promotion campaigns, aiming to endorse population and individual healthy lifestyles, were planned and organized, to various extents. However, the challenge is not merely to monitor the cardiovascular risk factors, but to evaluate the current risk perception and management from population's

standpoint, in order to bridge the knowledge-practice gaps and to suggest evidence-based recommendations. The findings will enable the decision-makers and health professionals to implement effective and target prevention strategies. At medium to long term, the outcome may have an impact on the global health.

The information below outlines four stages you may go through when changing your health habits or behavior. You will also find tips to help you improve your eating, physical activity habits, and overall health. The four stages of changing a health behavior are

Contemplation

Preparation

Action

Maintenance

Contemplation: "I'm thinking about it."

In this first stage, you are thinking about change and becoming motivated to get started.

You might be in this stage if you

- Have been considering change but are not quite ready to start
- Believe that your health, energy level, or overall well-being will improve if you develop new
- Habits
- are not sure how you will overcome the roadblocks that may keep you from starting to change

Preparation: "I have made up my mind to take action."

In this next stage, you are making plans and thinking of specific ideas that will work for you.

You might be in this stage if you

- Have decided that you are going to change and are ready to take action
- Have set some specific goals that you would like to meet
- Are getting ready to put your plan into action

Action: "I have started to make changes."

In this third stage, you are acting on your plan and making the changes you set out to achieve.

You might be in this stage if you

- Have been making eating, physical activity, and other behavior changes in the last 6 months or so
- Are adjusting to how it feels to eat healthier, be more active, and make other changes such as
- Getting more sleep or reducing screen time
- Have been trying to overcome things that sometimes block your success

Maintenance: "I have a new routine."

In this final stage, you have become used to your changes and have kept them up for more than 6 months.

You might be in this stage if

- Your changes have become a normal part of your routine

- You have found creative ways to stick with your routine
- You have had slip-ups and setbacks but have been able to get past them and make progress.

Contemplation: Are you thinking of making changes?

Making the leap from thinking about change to taking action can be hard and may take time. Asking yourself about the pros (benefits) and cons (things that get in the way) of changing your habits may be helpful. How would life be better if you made

some changes? Think about how the benefits of healthy eating or regular physical activity might relate to your overall health. For example, suppose your blood glucose, also called blood sugar, is a bit high and you have a parent, brother, or sister who has type 2 diabetes. This means you also may develop type 2 diabetes. You may find that it is easier to be physically active and eat healthy knowing that it may help control blood glucose and protect you from a serious disease.