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Review Article

Generalities of the Theoretical and Practical Knowledge of the Atherogenic Risk Factor in Type 2 Diabetic Patients

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Received Date: December 22, 2025; **Accepted date:** January 12, 2026; **Published date:** January 27, 2026

Citation: Horacio T. Sáez, Horacio Tabares Neyra, (2026), Generalities of the Theoretical and Practical Knowledge of the Atherogenic Risk Factor in Type 2 Diabetic Patients, *Clinical Research and Studies*, 5(1); **DOI:**10.31579/2835-2882/106

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Abstract

Atherosclerotic cardiovascular disease is considered coronary heart disease, cerebrovascular disease, or peripheral arterial disease of atherosclerotic origin. It represents the leading cause of morbidity and mortality among people with diabetes and generates approximately 37.3 billion in expenditures related to the cardiovascular system per year. Therefore, this bibliographic review was carried out with the objective of updating knowledge related to Atherogenic risk factor in type 2 diabetic patients; To fulfill this objective, scientific methods of the theoretical level were used that allowed the analysis and synthesis of the consulted bibliography in addition to making logical deductions that accessed the scientific positioning of the researchers, the critical analysis of the theoretical references and the writing of the conclusions. 18 investigations were reviewed according to the inclusion and exclusion criteria established by the authors. Finally, it was concluded that Type 2 Diabetes Mellitus constitutes a major cardiovascular risk factor for cardiovascular, peripheral vascular and cerebrovascular diseases since they occupy the first places in mortality; It is also necessary to consider several risk factors such as the age of onset and duration of Diabetes Mellitus; maintained glycemic lack of control, glycemic variability, as well as the presence of hypoglycemia; together with the decrease in glomerular filtration, albuminuria in addition to psychosocial factors.

Key words: atherogenic risk factor; cardiovascular disease: type 2 diabetes mellitus; morbidity and mortality

Introduction

Type 2 Diabetes Mellitus is one of the most important chronic diseases in public health worldwide, mainly due to its high rates of morbidity, mortality and costs related to health resources.

Currently, it is estimated that more than 450 million people in the world suffer from it and 5 million people die annually from causes associated with this disease. Furthermore, a global increase in Type 2 Diabetes Mellitus is projected up to 693 million cases by the year 2045. [1,2] At the moment; The authors propose that 42% of adults between 20 and 79 years of age with diabetes are undiagnosed, 34 million adults in the same age range have abnormal glucose tolerance, around 10% of the regional population in this group of age.

According to the WHO, statistically speaking, an increase in new cases of Diabetes Mellitus is estimated worldwide. Cuba expresses the same prevalence rates and in Santiago de Cuba a population of 1,047,946 inhabitants is estimated for a prevalence of Diabetes Mellitus of 54.8 diabetics per 1,000 inhabitants. [3, 4]

Therapeutic interventions to prevent, or at least delay the onset of complications in people with diabetes, have become more intensive, and control goals have become stricter; however, despite these facts, patients maintain an increased risk in 2-4 times of cardiovascular diseases and mortality is 1.5-3.6 times higher compared to the general population. [5].

Fei Y, Tsoi MF, and Cheung BMY, they think that most cardiovascular diseases can be explained by traditional risk factors, but there is wide variation in the burden of atherosclerosis contributed by each of them, and in many cases these risk factors fail to predict a cardiovascular event.

Even when people with diabetes benefit from cardiovascular prevention treatment, and the recommended goals are achieved, a residual risk of suffering a cardiovascular event persists.

González Hernández M, Ruiz Nápoles JB , Velásquez Almaguer S describe that in our country, heart diseases constitute an important cause of death despite having a specialized care network for patients with Diabetes Mellitus at the three levels of care, which include the components of primary, secondary, tertiary , which have allowed premature mortality to be reduced in recent years in ages between 30 and 60 years (economically active age, according to the WHO), and to shift to older age groups.

Therefore, we feel motivated to carry out this bibliographic review and update the scientific knowledge related to.

Developing

The theoretical and practical knowledge of the atherogenic risk factor in type 2 diabetic patients

From a pathophysiological point of view, it is well known that diabetes accelerates the progression of atherosclerosis inherent to humans. The expression of this process is similar to that of the general population, but with particularities; Thus, for example, in the arterial wall, not only do atheromatous plaques appear in the intima, but also calcifications in the middle layer, known as Mönckeberg sclerosis, which cause remodeling of the wall, with rigidity and loss of compliance, which affects cardiovascular hemodynamics. [6, 7, 8]

The result is diabetic macroangiopathy, characterized by being more frequent compared to the general population, earlier, more severe, extensive, multisegmental and diffuse, with more rapid progression, asymptomatic in most cases, and therefore, with a worse prognosis.[9]

The authors of this research reflect that in this context, Diabetes Mellitus has been considered an equivalent of ischemic coronary heart disease, however, this statement has been questioned due to the existing heterogeneity in the diabetic population, so the cardiovascular risk is not similar for all affected people.

Onyango AN.; Tahir NT, Ahmed HS, and Mahmmod OK they also consider that about 30% of patients with diabetes could have a 5-year cardiovascular risk, similar to that of the general population, including those under 40 years of age with a short duration of the disease; however, the risk over time throughout life, is undoubtedly greater.

The above reveals that the recommendations made by the main scientific societies do not consider diabetes with this equivalence, but instead propose that people with diabetes be classified as an independent group, with a higher cardiovascular risk than the general population, but stratified according to age; the presence of cardiovascular disease, complications, among other conditions, and therefore, an individualized cardiovascular risk.[9,10]

This allows us to identify the group of people with diabetes who will benefit most from preventive cardiovascular interventions, such as the use of antiplatelet agents. platelets and statins, and, in this way, be cost-effective.

Among the risk factors included in cardiovascular risk assessment systems are age and sex. Age is considered the main non-modifiable risk factor, it is continuous and increases progressively.

Other factors with an impact are: dyslipidemias, high blood pressure, smoking, abdominal obesity, family history of premature cardiovascular disease, obstructive sleep apnea, erectile sexual dysfunction and nonalcoholic fatty liver. [11, 12,13]

Dependents of diabetes are: the age of onset and duration of the disease, the maintained lack of glycemic control, glycemic variability, as well as the presence of hypoglycemia.

Decreased glomerular filtration rate and albuminuria also increase the risk for the onset and severity of cardiovascular disease. More recently, psychosocial factors have been incorporated as risk modifiers, which include socioeconomic position, social isolation, and lack of social support.

Most of these factors are not included in the risk scales that can be applied in people with diabetes, which restricts their predictive capacity, and underestimates the real risk; However, making them very complex and exhaustive would limit their application in clinical practice . [14, 15]

The authors of this research reflect that another way to predict cardiovascular disease in people with type 2 diabetes that has raised great interest is the identification of subclinical atherosclerosis, calculated close to the decision threshold, which could benefit by improving prediction, and therefore, decision making.

Currently, screening for subclinical atherosclerosis for the entire population is not recommended in clinical practice, but some of the guidelines mentioned above include it as a risk modifier. Agree with the consideration that diabetes increases cardiovascular risk, but not in a similar way for all patients, which is why its stratification through risk factors and the presence of complications, with or without tables, is necessary to individualize the therapeutic interventions and establish priorities, especially in primary health care.

In people with diabetes, the interaction of all the risk factors and conditions associated with diabetes, which determine the overall cardiovascular risk, takes particular value, so the individual must be evaluated as a whole, beyond the score on a scale.

Knowledge of the atherogenic risk factor in type 2 diabetic patients It is a topic that has been studied by scientists from Spain, the United States, England and other countries who consider postprandial hyperglycemia as the main risk factor for cardiovascular diseases, which generates 3 situations: glycation of important proteins and lipoproteins (LDL and HDL), increase in the polyol pathway and increase in free radicals.

Results of this study confirm that the lipid indices are risk indicators of glycemic control with higher prognostic value than traditional factors. So, non-high-density lipoprotein cholesterol and atherogenic index of plasma can be used as a significant predictor of glycemic control. [15, 16, 17, 18]

The authors of this research agree that this topic must be reviewed and updated since becouse dyslipidemia is commonly related to type 2 diabetes, and the atherogenic index of plasma is a strong marker to predict the risk of atherosclerosis and coronary heart disease.

Conclusions

Type 2 Diabetes Mellitus constitutes a major cardiovascular risk factor for cardiovascular, peripheral vascular and cerebrovascular diseases since they occupy the first places in mortality; It is also necessary to consider several risk factors such as the age of onset and duration of Diabetes Mellitus; maintained glycemic lack of control, glycemic variability, as well as the presence of hypoglycemia; together with the decrease in glomerular filtration, albuminuria in addition to psychosocial factors.

Conflicts of Interest

The authors declare no conflicts of interest.

Authors Contribution

Josefa Bell Castillo: Conception of the idea and preparation of the article. Data collection as well as analysis and interpretation. Contribution with the design, Search and review of bibliography; review and approval of the final version of the manuscript.

Jorge Gallego Galano. Contribution with the design, Search and review of bibliography. Contribution with the analysis and interpretation of the data; Participation in the revision of the manuscript

Maria de Jesus George Bell: Contribution with the analysis and interpretation of the data. Participation in the revisión.

Wilberto George Carrión: Contribution with the analysis and interpretation of the data. Participation in the revision of the manuscript.

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