Diabetes mellitus in Brazil: risk factors, classification and complications

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ABSTRACT Diabetes Mellitus (DM) is characterized by a metabolic disorder that has common hyperglycemia. Studies show differences in the prevalence of DM between different countries. DM is growing in developing countries. In 2013, Brazil ranked fourth among the countries with the highest number of diabetic people, with 11.9 million cases among adult individuals. Given this alarming picture, this review analyzes the relevance of diabetes mellitus in Brazil, highlighting its complications, causes or determining factors.

KEYWORDS Diabetes Mellitus, Hyperglycemia, Risk factors, Complications, Side dish

Introduction

The term diabetes mellitus (DM) describes a set of chronic metabolic disorders that have in common hyperglycemia, i.e. high blood glucose, which may be a result of defective secretion or insulin action [1]. Glucose is an essential carbohydrate for our body, it acts by providing energy, but in high concentrations it can result in blindness, kidney failure, vascular disease and neuropathy [2].

Studies show differences in the prevalence of DM between different countries. DM is increasing in developing countries [3-4]. In Brazil, DM represents a significant health problem [5]. According to the World Health Organization (WHO), the incidence rate of DM in Brazil has grown 61.8% in the last ten years, due to risk factors such as increased consumption of processed foods, ageing population, obesity. high cholesterol and physical inactivity [6-7].

In 2013, Brazil ranked fourth among the countries with the highest number of diabetic people, with 11.9 million cases among adult individuals [8]. Given this alarming picture, this review analyzes the relevance of diabetes mellitus in Brazil, highlighting its complications, causes or determining factors.

Methodology

This article was conducted through a literature review, whose development used the following questions: course, risk factors, classification and complications that occur associated with DM in Brazil.

DM is underway in Brazil

It is believed that an epidemic of DM is underway in Brazil, but there are few studies with a national scope, most involving cities or regions. Related numbers are worrying due to their impact on the health of the Brazilian population. Nationwide in the last three decades, DM ranges from 2% to 13% of people with higher prevalence in women, the elderly, overweight/obese people, sedentary individuals, lower level of education [9], in a central sample with 6% of the causes of death [10]. It is a significant risk factor for cardiovascular disease, which accounts for 31.3% of deaths and is often associated with other cardiovascular risk factors, such as hypertension and dyslipidemia [11-13].

With the present problem, it is noteworthy that in Brazil, there is a growing number of hospitalizations for diabetes, in higher proportions than hospitalizations for all causes [14]. In the late 1980s, the prevalence of DM in the adult population was estimated at 7.6%. However, data on frequency of DM in specific localities have been raised and point to higher rates [15]. Being 13.5% in São Carlos-SP [16], and 15% in Ribeirão Preto-SP [17]. Taken together, some data have been reported for subgroups of the Brazilian population, such as indigenous peoples and those of oriental descent. From these points the introduction of DM starts from an epidemiological transition. Between the 1970s and 1990s cases of glycemic alteration in indigenous peoples

were rare [18-19].

However, indigenous people from the state of Mato Grosso have 4.5% DM and 2.2% impaired glucose tolerance; obesity in 14.2% of men and 30.8% of women. In Xavante Indians, DM rates are around 28.2%, being 18.4% in men and 40.6% in women; Decreased glucose tolerance was diagnosed in 32.3%, hypertension in 17.5% and obesity in 50.8% of subjects [20]. Beside Japanese-Brazilians have at least twice the prevalence of DM when compared to the general Brazilian population. Due to the complexity of the mechanism of the western environment to favourable genetic predisposition [21].

Besides, in Brazil, DM extensive geographical distribution alone magnitude of this public health problem. In cities in the South and Southeast, considered to have the highest economic development in the country, they present higher prevalence of diabetes mellitus and impaired glucose tolerance [14].

Risk factors associated with DM

Some risk factors influence the development of DM (Figure 1). It is well established that the control of these associated factors, together with the control of glucose rates becomes protective against secondary complications by analyzing the importance of DM as a disease burden [22-26].

DM classification

DM is classified into type 1 and 2, gestational diabetes and some other types. Type 1 Diabetes Mellitus (DM1) is a chronic disease in which pancreatic β cells are destroyed, which are responsible for synthesizing the hormone insulin. DM1 can also be classified as Type 1A Autoimmune Diabetes Mellitus, which involves genetic and environmental means, as some viral infections, in this process, the main genes involved are in the Human Leukocyte Antigen (HLA), these alleles may lead to the evolution of the disease or protect the body against her. B cell destruction can be variable, usually faster in children and latent in adults, in what is called Adult Latent Autoimmune Diabetes (LADA). The other classification of DM1 is Type 1B Idiopathic Diabetes Mellitus, which appears unknown and has no autoimmunity markers against B cells and is not associated with HLA haplotypes, patients with DM1B may trigger varying degrees of insulin and ketoacidosis [27].

Type 2 diabetes mellitus (T2DM) is the most common, characterized by the resistance of insulin action, which decreases glucose uptake in insulin-dependent tissue, this factor can elevate insulin in the bloodstream and risk factors as overweight. , sedentary lifestyle may increase the chances of developing the disease, and because of the evolution of the problem, insulin therapy is necessary [28].

Gestational diabetes mellitus (GDM) is characterized by carbohydrate intolerance, diagnosed in pregnancy, and is related to insulin resistance and decreased B-cell activity. Stress in the gestational period may be a risk factor that elevates counter-regulatory hormones. If the pregnant woman does not seek treatment, it can trigger complications, such as preeclampsia and excessive fetal growth [29].

DM complications

The complications of DM increase over the years; a strategy to minimize the onset of these complications early is its identification. Complications include diabetic ketoacidosis, retinopathy,
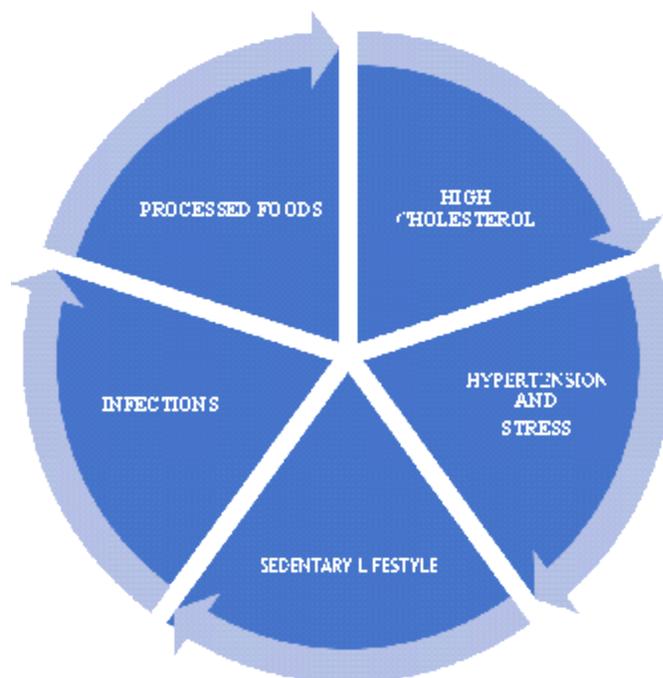

Figure 1: Risk Factors Involved in Diabetes Development.

nephropathy, ischemic heart disease, cerebrovascular and peripheral vascular diseases, and neuropathies. There are also degenerative complications such as stroke, microangiopathy, acute myocardial infarction and peripheral arteriopathy [30]. The time of evolution, inadequate control and genetic factors of this pathology characterize the development of chronic complications of diabetes. In diabetes mellitus, in a long hyperglycemic state will have the formation of covalent bridges with the plasma proteins by glucose, through glycation, which is a non-enzymatic process. The formation of advanced glycation end products and protein glycation play an essential role in the pathogenesis of diabetic complications. Protein glycation interferes with normal functions by modifying molecular conformations, which alters enzymatic activity and interferes with receptor function. The binding of AGEs may favour diabetic complications with lipids and nucleic acids [31].

Conclusion

DM represents a significant public health problem in Brazil, as its incidence, prevalence and comorbidities in the Brazilian population have been increasing over the years. Besides, in Brazil, DM has a wide geographical distribution. In the cities of the South.

and Southeast, considered to have the most significant economic development in the country, they have a higher prevalence of diabetes mellitus and lower glucose tolerance. Attention is drawn to the description of prevalence in women, the elderly, overweight/obese people sedentary individuals, lower level of education. New studies are essential to strengthen the health care of people with DM, as they identify and monitor the risk factors.

Conflict of Interest

There are no conflicts of interest to declare by any of the authors of this study.

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