

REVIEW

Diabetes Care in Venezuela



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Abstract

BACKGROUND The incidence of type 2 diabetes (T2D) and its economic burden have increased in Venezuela, posing difficult challenges in a country already in great turmoil.

OBJECTIVES The aim of this study was to review the prevalence, causes, prevention, management, health policies, and challenges for successful management of diabetes and its complications in Venezuela.

METHODS A comprehensive literature review spanning 1960 to 2015 was performed. Literature not indexed also was reviewed. The weighted prevalence of diabetes and prediabetes was estimated from published regional and subnational population-based studies. Diabetes care strategies were analyzed.

FINDINGS In Venezuela, the weighted prevalence of diabetes was 7.7% and prediabetes was 11.2%. Diabetes was the fifth leading cause of death (7.1%) in 2012 with the mortality rate increasing 7% per year from 1990 to 2012. In 2012, cardiovascular disease and diabetes together were the leading cause of disability-adjusted life years. T2D drivers are genetic, epigenetic, and lifestyle, including unhealthy dietary patterns and physical inactivity. Obesity, insulin resistance, and metabolic syndrome are present at lower cutoffs for body mass index, homeostatic model assessment, and visceral or ectopic fat, respectively. Institutional programs for early detection and/or prevention of T2D have not been established. Most patients with diabetes (~87%) are cared for in public facilities in a fragmented health system. Local clinical practice guidelines are available, but implementation is suboptimal and supporting information is limited.

CONCLUSIONS Strategies to improve diabetes care in Venezuela include enhancing resources, reducing costs, improving education, implementing screening (using Latin America Finnish Diabetes Risk Score), promoting diabetes care units, avoiding insulin levels as diagnostic tool, correct use of oral glucose tolerance testing and metformin as first-line T2D treatment, and reducing health system fragmentation. Use of the Venezuelan adaptation of the transcultural Diabetes Nutrition Algorithm for lifestyle recommendations and the Latin American Diabetes Association guidelines for pharmacologic interventions can assist primary care physicians in diabetes management.

KEY WORDS diabetes, diabetes care, management, prediabetes, Venezuela

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INTRODUCTION

Nutritional transition has promulgated adverse nutritional and lifestyle habits in Venezuela and other Latin American countries, clearly contributing to the incidence of noncommunicable diseases, especially obesity and diabetes.¹ Diabetes was the fifth leading cause of death in Venezuela in 2012, with a prevalence rate of 6.6% in Barquisimeto, a western Venezuelan city.² Considering the burden imposed by diabetes and the costs for its control, prevention, and treatment represents clear challenges for the health system. Unfortunately, the care of patients with diabetes in Venezuela is provided by a fragmented health system and prevention programs are not at all structured. This fragmentation of Venezuelan health systems is characterized by restricted access, poor technical quality, inefficient use of resources, and low user satisfaction.³

The Bolivarian Republic of Venezuela is a country with an estimated population in 2013 of 30,405,000 inhabitants,⁴ a life expectancy at birth of 76 years,⁵ and 8 geographic regions: capital, central, western, northeastern, Guayana, Andes, Zulia, and the Llanos (Plains).⁴ Each region has peculiarities regarding geography, climate, urban/rural proportion, income, food availability, and eating patterns. Moreover, the Venezuelan population has unique epidemiologic, cultural, physiological, ethnic, nutritional, pathologic, and lifestyle characteristics, as well as a political, economic, and social environment that is distinct and mostly unstable. All of these factors can influence the prevalence, prevention, and treatment of diabetes and its complications. The aim of this study was to review the status of the prevalence, causes, prevention, management, health policies, and challenges for successful management of diabetes and its complications in Venezuela. The results can provide useful information for authorities to implement effective actions in diabetes care that decrease complication rates and disease burden.

METHODS

A comprehensive literature review spanning 1960 to 2015 was performed, using “diabetes” and “Venezuela” as keywords. Abstracts and full papers (either in English or Spanish) from the identified references were collected and screened by the authors for inclusion in this review. From the 1454 references identified in databases used (PUBMED [149], OVID [1004], ScELO [57], Revencyt [4], and LILACS [240]), 68 met inclusion criteria for providing

information about diabetes in Venezuela, specifically prevalence, morbidity/mortality, causes/drivers, pathophysiology, associated cardiometabolic risk factors, prevention, management, complications, costs, national programs, and health policies. Literature not indexed, such as white papers, government publications, conference proceedings, and other gray literature was selected and included if considered appropriate. The literature review was complemented by direct personal communications and contacts with national and provincial health authorities of Venezuela in an attempt to include unpublished evidence and policies to enhance completeness.

A national population survey to investigate the prevalence of diabetes and prediabetes has not been performed in Venezuela.⁶ From the present review, the prevalence of diabetes and prediabetes was estimated taking into account published regional and subnational studies. A weighted prevalence analysis was conducted based on the number of participants included in each study. In other words, the prevalence was adjusted to reflect importance by value or proportion of individuals included in every study. Prevalence studies in children and adolescents, with unclear or poor methodology, without population-based sampling, or involving patients attending a local health center were excluded.

RESULTS

Causes and Factors Associated with Diabetes in Venezuela

Genetic and epigenetic factors. T2D is the archetype of a complex disease, with genetic and environmental determinants. In Venezuelan individuals, family history of T2D in males with or without obesity is associated with a decrease in insulin secretion, expressed as lower Homeostasis model assessment (HOMA) β -cell values, highlighting the role of genetic susceptibility.⁷ Multiple genes conferring T2D risk were initially identified using candidate gene and linkage-based studies, more recently by genome-wide association studies.⁸ To date, the transcription factor 7-like 2 (*TCF7L2*) gene is the T2D risk locus with the largest effect size per risk allele and the most replicated across studies.⁹ In Venezuela, a recent study demonstrated that individuals harboring a CT genotype and carriers of the allele T of *TCF7L2* rs7903146 single nucleotide polymorphism, have a higher T2D risk (odds ratio, 2.9 and 2.3, respectively).¹⁰ Furthermore, an association has been demonstrated between the Gly482Ser polymorphism of the peroxisome

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