

## Research Article

# Baseline Risk for Type 2 Diabetes in Patients with Systemic Arterial Hypertension

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## Abstract

**Background:** The prevalence of arterial hypertension in Mexico was 33% in men and 31% in women. Diabetes mellitus ranks first in deaths per year; when both diseases coexist, the number of complications increases.

**Objective:** To determine the baseline risk for Type 2 Diabetes Mellitus in patients with systemic arterial hypertension in the family medicine unit #27 of Tijuana.

**Design and Setting:** Descriptive cross-sectional study.

**Methods:** The study was conducted in patients diagnosed with systemic arterial hypertension. The sample size was 400 patients; the FINDRISC questionnaire was applied, which assesses the baseline risk of suffering Type 2 Diabetes Mellitus in 10 years. In the statistical analysis descriptive statistics were used with a 95% confidence interval.

**Results:** It was found that 160 patients (40%) presented a high risk of developing Type 2 Diabetes Mellitus in 10 years. The risk factor with the highest prevalence was obesity (n=273, 69%).

**Conclusion:** The risk of developing Type 2 Diabetes Mellitus is high in this region of Tijuana.

**Keywords:** Systemic Arterial Hypertension; Type 2 Diabetes Mellitus; FINDRISC

## Introduction

Type 2 diabetes mellitus (DM) is a heterogeneous group of disorders characterized by elevated blood glucose levels due to partial deficiency in insulin production. It is considered a public health problem worldwide [1]. The risk factors for the development of type 2 diabetes can be modified when they are identified in early stages. Inadequate dietary habits, overweight, sedentary lifestyle, dyslipidemia, high blood pressure and genetic factors are the basis of insulin resistance and metabolic syndrome that is epidemically affecting the world population [2].

It is important to emphasize behaviors related to lifestyle and metabolic risk factors (hypertension, dyslipidemia and impaired glucose metabolism). Systemic arterial hypertension is a very important risk factor for developing Type 2 Diabetes Mellitus and cardiovascular diseases [3-5]. In primary care it is important to avoid or delay the onset of the disease [6,7]. It has been shown that identifying and intervening in the lifestyle of these patients delays the progression to diabetes in up to 58% of cases [8]. Due to the chronic nature of these diseases, the patient with diabetes mellitus and systemic arterial hypertension requires continuous medical care to prevent short-term complications and reduce the risk of long-term complications, self-care is also important [9].

There are diseases related to Type 2 Diabetes Mellitus, the most important is systemic arterial hypertension, which is defined as a multiple etiology syndrome and is the most common modifiable risk

factor for cardiovascular disease (CVD) and death [10]. In Mexico, DM2 ranks first in number of deaths per year, mortality rates show an upward trend in both sexes with more than 70,000 deaths and 400,000 new cases annually [11]. The association observed in patients with both diseases is interesting, which has raised the possibility of a pathophysiological basis that links them to each other. Most of the work in improving diabetes outcomes has focused on clinical care but diabetes is a public health problem that also requires clinical care in the preventive and screening field [12,13].

Early detection of type 2 diabetes mellitus is difficult. There are different scales that assess the risk of diabetes and the most used is the FINDRISC test (Finnish Diabetes Risk Score), which seeks to determine what relationship exists between the values of different anthropometric and clinical parameters with the development of diabetes mellitus at 10 years. The variables it measures are: body mass index, waist circumference, physical activity, blood pressure, dietary consumption, the use of antihypertensive medications, a history of high blood glucose and family history of diabetes [14]. The objective of the research was to determine the baseline risk for Type 2 Diabetes Mellitus (T2D) in patients with systemic arterial hypertension in the family medicine unit #27 (FMU 27) in Tijuana, Baja California, Mexico.

## Methods

### Study design and population

A cross-sectional descriptive study was carried out to determine

the baseline risk of presenting T2D in patients with systemic Arterial Hypertension according to the FINDRISC questionnaire from June to August 2019. The research was developed in FMU 27 of the Instituto Mexicano del Seguro Social (IMSS), primary care unit and main center of health care in the city. Patients who met the following inclusion criteria were included: systemic arterial hypertension, age over 20 years, agree to participate in the study and sign the informed consent letter. Patients with chronic renal failure or pregnancy were excluded. Participants with incomplete information were eliminated.

### Variables

The variables were collected on a standardized data sheet; the variables collected were: age according to the year of birth; sex according to phenotypic characteristics; weight, height, abdominal circumference and BMI with standardized anthropometric measurements with a scale with stadiometer and measuring tape. Subsequently, the FINDRISC questionnaire was applied, which is a validated instrument with a Cronbach Alpha 0.84 and consists of 8 items with likert responses, which are: 1) age, four response options (less than 35 years=0 points; 35 to 44 years=1 point; 45-54 years=2 points; 55-64 years=3 points and more than 64 years=4 points); 2) Body mass index, three response options (less than 25kg/m<sup>2</sup>=0 points; 25 to 30 kg/m<sup>2</sup>=1 point and more than 30kg/m<sup>2</sup>=3 points); 3) Abdominal perimeter, three options for men (less than 90cm=0 points; 90-102 cm= 3 points and more than 102cm=4 points) and three options for women (less than 80cm= 0 points; 80-88 cm=3 points and more than 88cm=4 points); 4) Diagnosis of T2D in at least one member of the family, three response options (no=0 points; yes in grandparents, uncles, cousins=3 points and yes in parents, children, siblings=5 points); 5) Physical activity for at least 30 minutes daily, with two response options, (yes=0 points and no=2 points); 6) Frequency of consumption of fruit, vegetables or whole grains, with two response options, (daily=0 points and not daily=1 point); 7) Use of medications for systemic arterial hypertension or have systemic arterial hypertension, two response options, (no=0 points and yes=2 points); 8) Glucose detection greater than 100mg/dL, two response options (no=0 points and yes=5 points). High risk is considered at a score greater than 15 points.

### Statistical analysis

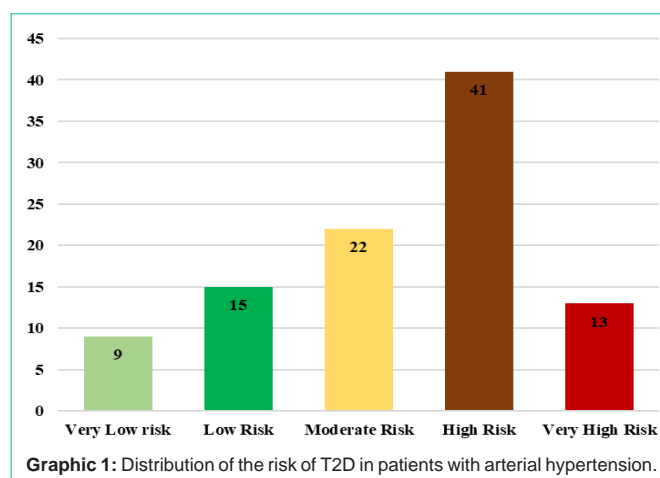
The data obtained was integrated into the data collection sheets and analyzed using the SPSS program version 21 in Spanish. We perform descriptive statistics; for qualitative variables frequencies and percentages; for quantitative variables, mean and standard deviation.

### Ethics

The study was approved by the local health research and ethics committee #204; with registration number R-2019-204-018. The research was conducted under the general health law on health research, bioethical principles and the Helsinki declaration.

### Results

396 patients with arterial hypertension were included. The age group with the highest prevalence was 45-54 years (33%, n=129). The most frequent sex was women (54%, n=212). Marital status was found more frequently in married (47%, n=186) and free union with (34%, n=135). According to the body mass index (BMI), the majority were obese (69%, n=276 patients). In abdominal circumference it



was greater than 90 centimeters in 69% of men (n=127); in women, 79% (n=167) were above 80 centimeters. The risk distribution of developing T2D was as follows (Graphic 1): high risk (41%, n=162), moderate risk (22%, n=87), low risk (15%, n=59), very high risk (13%, n=51) and very low risk (9%, n=35).

### Discussion and Conclusion

The most important finding of our study was a high prevalence of risk to develop T2D at 10 years in our population. Salinero in Madrid, Spain [15], through the FINDRISC questionnaire found that 19.5% of the patients obtained a result greater than or equal to 15 points (high risk), in comparison to our study a sample with a higher risk is established, which proposes to analyze the main factors that may be involved in our population. According to Mendiola-Pastrana [16] in a study in Mexico (2017) on the validation of the diagnostic test of the FINDRISC questionnaire, they determined that 156 patients (52.84%) were at high risk to develop T2D, compared to our study the percentage was very similar, which agrees according to the type of population analyzed.

The baseline risk of developing T2D in patients with systemic arterial hypertension was 54% (high and very high risk), which represents 213 participants of the total sample. In our study, we found that 5 out of 10 patients with systemic arterial hypertension in primary care have a FINDRISC  $\geq 15$  points. It is important to apply preventive measures in these patients to avoid or delay the development of T2D to reduce complications and preserve quality of life.

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