

## Research Article

# Risk Evaluation for Type 2 Diabetes in Adults from Tijuana, México

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## Abstract

**Background:** Diabetes Mellitus (DM) is one of the principal pathologies that cause morbimortality in Mexico and the world. DM is a group of metabolic disorders that develops when the required levels of insulin for keep the normal values of plasmatic glucose are not sufficient. Evidence show the importance for detection and identification of people in risk for develop DM.

**Aim:** The purpose of this study is to evaluate the type 2 diabetes risk in adults from Tijuana, Mexico.

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

**Methods:** A descriptive cross-sectional study was conducted in the Family Medicine Unit (FMU) #27, Tijuana, Mexico; the participants answered the FINDRISC test for detection of type 2 diabetes risk, this previous voluntary authorization and informed consent. Patients with increased risk for type 2 diabetes (7 or more points) were sent to medical evaluation. The sample was 356 patients without previous diagnostic of diabetes. For statistical analysis was applied descriptive statistics. We used SPSS version 21 program for the analysis.

**Results:** We applied 361 tests; 30% (n=107) of patients showed a low risk for develop type 2 diabetes (less than 7 points), 70% (n=254) an increased risk (7 or more points); 63% (n=229) patients do not perform physical activity; 60% (n=218) had a familiar in first or second degree with diabetes; 68% (n=245) had a Body Mass Index (BMI) greater than 25kg/m<sup>2</sup>; 79% (n=171) of women had an abdominal circumference greater than 80 cm and 63% (n=90) of men had an abdominal circumference greater than 92 cm.

**Conclusion:** The study clarifies how the designed tools to been answered through interrogation or even self-applying have various limitations, over all in the interpretation area, especially in the physical activity, diabetes familiar precedent and altered glycemia precedent. The FINDRISC test shown to be a good support for identification of patients with increased risk of type 2 diabetes.

**Keywords:** Type 2 Diabetes; Risk Score; FINDRISC

## Introduction

Diabetes Mellitus (DM) is a group of metabolic disorders that develops when the required levels of insulin for keep the normal values of plasmatic glucose are not sufficient. Type 2 Diabetes is most common, representing the 90% of the cases and is more frequent in patients with overweight or obesity, metabolic syndrome and familiar antecedent of DM or gestational diabetes [1]. Globally, near 422 million adults had diabetes in 2014 compared to 108 million in 1980, the worldwide prevalence of diabetes has almost doubled from 4.7% to 8.5% in the adult population [2].

Education of patients is essential for control disease and decrease complications. Programs that modify the life style, involving a health team, patients and a support group improve the weight control and disease acceptance. Group education is preferred over individual education to improve the glycemic control. The adequate changes in alimentation, physical activity and the implementation of behavioral therapies allows weight loss and glycemic control, increasing the

efficacy if those are combined [3].

Many predictive model for diabetes risk have been developed, typically combining risk factors such as life style, demography, clinical background and anthropometric information. Evidence show that patients with prediabetes have a 50% of risk increase to suffer DM over the next 5 years and approximately 75% of the population with prediabetes will develop type 2 diabetes [4]. Detection of DM or prediabetes through support tools, such as the American Diabetes Association (ADA) Risk Test, is appropriate for give an idea to the health personnel about perform a diagnostic exam. Prediabetes and DM share a long asymptomatic phase previous clinical diagnostic when the early detection is possible [5]. In contrast, despite the many test for detection of diabetes risk, there is little evidence about use of those test as part of a formal policy of health or practical guides [6].

Giblin et al. (2016), proved that the use of the ADA Risk Test in different establishments, in this case dental clinics, works as screening form to identification of patients with increased risk for

develop type 2 diabetes [7]. Silvestre et al. (2017), showed the utility of the FINDRISC Test as screening tool for identification of patients with type 2 diabetes and prediabetes when is used in patients with overweight. Also is indicated how this test may vary in efficacy depending on the population or ethnicity in which it is applied [8]. Based on the above, the main objective of the study is to evaluate the type 2 diabetes risk in adults from Tijuana, Mexico.

## Materials and Methods

A descriptive cross-sectional study was carried out, in the Family Medicine Unite #27 of the Instituto Mexicano del Seguro Social (IMSS), located in Tijuana, Mexico; the patients were selected by a consecutive sampling techniques and they met the following inclusion criteria: 18 years or more that accepted and signed informed consent; patients with current or previous diagnosis of pregnant, prediabetes, type 1 or 2 diabetes were not included and eliminated those who did not complete the survey or those with incomplete information. Patients answered the FINDRISC test for detection of type 2 diabetes risk. The weight and height were measured if the patient did not know this data. Patients with increased risk for type 2 diabetes (7 or more points) were sent to medical consultation (Graphic 1).

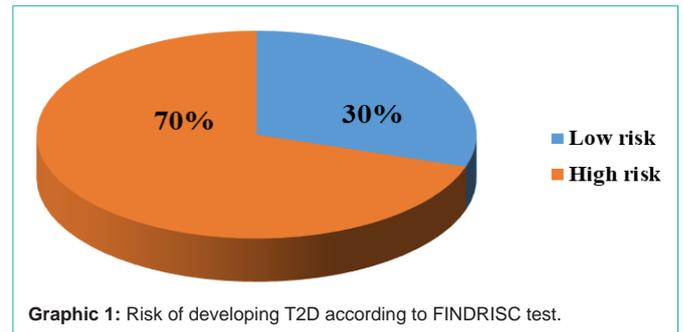
The 8 items that integrate the FINDRISC test are the follows: physical activity 30 minutes/day (yes or not), age (<35 years, 35-34, 45-54, 55-64 or >64 years), familiar antecedent of diabetes (no, first-degree familiar o second-degree familiar), fruit or vegetables in diet (daily or not daily), abdominal circumference (<80cm, 80-88 cm or >88cm for women and <92 cm, 92-102 cm or >102cm for men), hypertension (yes or not), antecedent of altered glycemia (yes or not) and body mass index (BMI) (<25kg/m<sup>2</sup>, 25-30 kg/m<sup>2</sup> or >30kg/m<sup>2</sup>). The recollected data was integrated into data collection sheets and analyzed using the SPSS program version 21 in Spanish, where we applied descriptive statistics. The Protocol was authorized by the Local Committee of Research and Ethics in Health Research.

## Results

Between May to June 2019, we applied 361 FINDRISC tests; all test were correctly answered with the respective informant consent. The data obtained from the scores showed that 29.6% (n=107) of patients had a low risk for develop type 2 diabetes (less than 7 points) and 70.4% (n=254) showed an increased risk (7 or more points); in the question about physical activity, 63.4% (n=229) patients do not perform physical activity; the question of any familiar with diabetes showed that 60.4% (n=218) had a familiar in first and/or second degree with diabetes; 67.9% (n=245) of the patients had a BMI greater than 25 kg/m<sup>2</sup>; in the item about abdominal circumference, 78.8% (n=171) of women had an abdominal circumference greater than 80 cm and 62.5% (n=90) of men had an abdominal circumference greater than 92 cm; 14.9% of patients had the antecedent of altered glycemia and only 12.4% (n=45) had the antecedent of hypertension.

## Discussion and Conclusion

We found an important relation between the familiar antecedent in first-degree of diabetes and the personal antecedent of altered glycemia, this association was presented in the 48.1% of patients. Furthermore, with respect to the patients with familiar antecedent of diabetes, 42.6% had a BMI  $\geq 30$ kg/m<sup>2</sup>. It is known that overweight,



obesity and abdominal circumference are the most important risk factors for develop diabetes [9], in this study we found that 44.4% of patient with BMI  $\geq 30$ kg/m<sup>2</sup> had a previous altered glycemia; in women with altered glycemia antecedent, 73.7% had an abdominal circumference  $\geq 88$ cm. As an extra data, we found that 85% of women with abdominal circumference  $\geq 88$ cm and 50% of men with abdominal circumference  $\geq 102$ cm presented the antecedent of hypertension.

We think this study clarifies how the designed tools to been answered through interrogation or even self-applying have various limitations in the interpretation area, especially in the physical activity, diabetes familiar precedent and altered glycemia precedent. The FINDRISC test is more specific if the information is obtained from health personnel than the self-applying form. The FINDRISC test shown to be a good support tool for identification of patients with increased risk of type 2 diabetes and we emphasize the importance to have more tools like the FINDRISC test.

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