

Original article

The Diabetic Immigrant: Cardiovascular Risk Factors and Control. Contributions of the IDIME Study

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ABSTRACT

Introduction and objectives: The aim of this study was to determine the clinical characteristics of diabetes and associated cardiovascular risk factors in immigrants with diabetes in Spain.

Methods: A multicenter, observational, cross-sectional study including a cohort of 605 diabetic immigrants and 307 native diabetics was conducted in patients diagnosed with diabetes and treated in primary and specialized care in Spain. A consecutive sampling method was followed. We studied epidemiological, clinical and laboratory variables related to diabetes and the presence of classical risk factors.

Results: The immigrant diabetic patient was younger (50.4 [11.5] vs 62.7 [13] years) and had fewer years of diabetes progression (5.8 [6.4] vs 10.5 [8.3] years) ($P < .001$) compared with native diabetic patients. Immigrants from South America with diabetes were more obese. No statistically significant differences were found in abdominal obesity or the waist/height ratio. Glycemic control was worse in immigrants than in the native Spaniards group (glycosylated hemoglobin, 7.8 [2.2] vs 7.1 [1.5%]), especially among South Asians (8.1 [2.5%]) ($P < .001$), in whom insulin use was lower (12.8% vs 30.7% in other immigrants) ($P < .001$). However, the prevalence of chronic complications of diabetes was lower among immigrants, particularly that of macrovascular complications (7.7% vs 24.4%) ($P < .01$).

Conclusions: In our study the profile of immigrant diabetics in Spain is one of a young diabetic without complications, but with worse metabolic control. These findings provide an excellent opportunity to implement preventive measures.

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El diabético inmigrante: factores de riesgo cardiovascular y su control. Aportaciones del estudio IDIME

RESUMEN

Introducción y objetivos: El objetivo del estudio es conocer las características clínicas de la diabetes mellitus y los factores de riesgo cardiovascular asociados en los diabéticos inmigrados a España.

Métodos: Estudio multicéntrico, observacional, transversal con una cohorte de 605 diabéticos inmigrados y 307 diabéticos autóctonos, realizado en pacientes diagnosticados de diabetes mellitus atendidos en consultas de atención primaria y especializada en España. El muestreo se realizó a partir de casos sucesivos por orden de llegada a la consulta. Se estudian variables epidemiológicas, clínicas y analíticas relacionadas con la diabetes mellitus, así como la presencia de factores de riesgo clásicos.

Resultados: El paciente diabético inmigrado es más joven ($50,4 \pm 11,5$ frente a $62,7 \pm 13$ años) y con menos años de evolución de la enfermedad ($5,8 \pm 6,4$ frente a $10,5 \pm 8,3$ años) ($p < 0,001$) que el diabético autóctono. Los diabéticos inmigrados de Hispanoamérica tienen mayor obesidad. No hay diferencias estadísticamente significativas con respecto a la obesidad abdominal o el índice cintura/estatura. El control glucémico era peor que en los autóctonos (glucohemoglobina, el $7,8 \pm 2,2$ frente al $7,1 \pm 1,5\%$), especialmente entre los indostaníes ($8,1 \pm 2,5\%$) ($p < 0,001$), que además utilizan menos insulina (el 12,8 frente al 30,7% de otros inmigrantes) ($p < 0,001$). Sin embargo, la prevalencia de las complicaciones crónicas de la diabetes mellitus es menor entre los inmigrados, especialmente las macrovasculares (el 7,7 frente al 24,4%) ($p < 0,01$).

Palabras clave:

Diabetes mellitus

Inmigración

Control metabólico

Complicaciones

Factores de riesgo cardiovascular

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◇ The list of the redGDPS researchers is shown in the Appendix.

Conclusiones: En nuestro estudio, el perfil de los diabéticos inmigrados a España es el de un diabético joven y sin complicaciones, pero con peor control metabólico. Todo ello nos proporciona una excelente oportunidad preventiva.

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Abbreviations

DM: diabetes mellitus
HbA_{1c}: glycosylated hemoglobin

INTRODUCTION

The prevalence of diabetes mellitus (DM) in Spain has steadily increased in recent decades¹ and currently affects 13.8% of the adult population,² thus constituting a serious health problem.³ The prevalence of this disease varies enormously in distinct areas of the world,⁴ which has been attributed to genetic and environmental factors.⁵

Patients with DM often have concomitant cardiovascular risk factors, such as hypertension, dyslipidemia or obesity. It has been established that the combined control of these cardiovascular risk factors reduces the incidence of the complications of DM and consequently the morbidity, mortality and costs associated with this disease.^{6–11}

In the last decade, immigration has become one of the public health issues with the greatest impact in Spain. Currently, the immigrant population forms more than 10% of the total Spanish population.¹² Providing health care to this population is a major challenge due to the cultural, socioeconomic, religious and linguistic issues involved. The phenomenon of immigration and the adaptation of ethnic minorities to the host culture can lead to an 8-fold increase in the prevalence of DM.⁵ In addition, studies have shown that diabetic immigrants from specific ethnic minorities may show different physiopathologies,¹³ have an increased association with some cardiovascular risk factors¹⁴ and be more susceptible to certain complications,^{13,15} either due to genetic predisposition, inadequate access to health care or differences in the quality of care.^{16–18}

However, although there are local studies on specific aspects of DM,^{19,20} no national epidemiological survey has been conducted to provide data on DM in immigrants to Spain.

The aim of this study was to determine the clinical characteristics of DM and cardiovascular risk factors associated with immigrant diabetics in Spain.

METHODS

A multicenter, observational, cross-sectional study was designed, which included a cohort of diabetic patients (immigrant or native) seen in primary and specialized care centers in Spain.

Study Population

The following inclusion criteria were applied: patients of both sexes; 18 years to 99 years of age; a diagnosis of any clinical form of DM; a blood test conducted in the last 6 months that included glucose, glycosylated hemoglobin (HbA_{1c}), and creatinine values and lipid profile and informed consent to participate in the study.

The sample size was determined according to the aim of the study. HbA_{1c} level was considered to be the most relevant variable to detect differences among ethnic groups with DM. Assuming an alpha risk of 0.05 and a beta risk of 0.20 at a ratio of 2:1, a minimum of 590 immigrant diabetic patients and 295 native diabetic patients were required to detect a difference of ≥ 0.3 units in the HbA_{1c} value (standard deviation of 1.5). This was increased by 20% in case of possible losses to follow-up. The final sample included 912 subjects (605 immigrants and 307 native Spaniards). The field researchers were primary care physicians who were members of the Network for the Study of Diabetes in Primary Care (redGDPS in Spanish) (n=61) and endocrinologists (n=5) working in areas with a large number of immigrants. All of the researchers voluntarily agreed to participate in the study. In total, the redGDPS has over 2000 members, most of whom are primary care physicians with an interest in DM. Each researcher was assigned to collect clinical information related to DM from 14 immigrant patients and 7 native patients. Once this figure was achieved, the doctors were free to include more patients. Consecutive patients were selected until the target number was reached in each group. No external audit was performed. Figure 1 shows the distribution of patients and researchers.

Data were collected during a single visit to the doctor, based on the patient's clinical history and physical examination.

Study Variables

The following data were collected from each patient: age, sex, country of origin, ethnic group, years of residence in Spain, clinical evidence of DM and its treatment, and anthropometric and clinical measurements, such as systolic and diastolic blood pressure. Data were recorded from the last blood test: blood glucose, HbA_{1c}, lipid profile and renal function (creatinine and microalbuminuria). We also studied the presence and treatment of classical cardiovascular risk factors (hypertension, dyslipidemia and smoking).

Definition of the Main Variables

- Immigrant. Defined as a person born in another country living in Spain. For the statistical analysis, 5 groups were defined: native Spaniards, Latin American, South Asian, North African and other ethnic group.
- Diabetes mellitus. A diagnosis of DM was given to patients who met the criteria of the American Diabetes Association (2004).²¹
- Hypertension. Defined according to the criterion of the *Joint National Committee*.²²
- Dyslipidemia. A patient was diagnosed with dyslipidemia when low-density lipoprotein cholesterol (LDLc) levels were >100 mg/dL or triglyceride levels were >150 mg/dL or high-density lipoprotein levels were <50 mg/dL or the patient was receiving pharmacological treatment for dyslipidemia.²³
- Obesity. A patient was diagnosed as obese when his or her body mass index (BMI) was ≥ 30 . Abdominal obesity was defined as a waist circumference ≥ 102 cm for men and ≥ 88 cm for women.⁶
- Control of risk factors. A good level of control was established according to the criteria of the American Diabetes Association (2010).²³ The following values were considered to indicate good control: hypertension, when blood pressure was $<130/80$ mmHg;

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