



ORIGINAL ARTICLE

## High incidence of type 1 diabetes in the immigrant population of Osona and Baix Camp<sup>☆</sup>



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### KEYWORDS

Type 1 diabetes mellitus;  
Immigration;  
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### Abstract

**Introduction:** It has been postulated that migration could act as a modifying factor in the incidence of type 1 diabetes mellitus (T1DM), so the aim of this study is to determine if there are differences in the incidence of T1DM by origin.

**Material and methods:** Retrospective study of cases of T1DM onset in the population younger than 19 years old in Osona and Baix Camp between 2000 and 2012, using the medical histories of endocrinology units of the health centres and demographics from Catalonia Statistical Institute as sources.

**Results:** The child population in Osona and Baix Camp increased by 36.6%, with 18.9% in the local population, and 48.2% in the immigrant population, and most of this increase (90%) in the Maghreb immigrant group. A total of 118 diabetics onset were found, 66.9% in the local population, 32.2% Maghrebi population, and 0.9% in children from other countries, with a total incidence rate of 14.4 cases per 100,000 population/year ( $c/10^5p-y$ ). The incidence is higher in the Maghrebi population compared to the local population, 37.1 vs 11.2  $c/10^5p-y$  ( $P < .001$ ), and in children under 5 years compared to the 5–18 years group, 18.9 vs 12.5  $c/10^5p-y$  ( $P < .05$ ), with no differences between sexes ( $P > .05$ ). The relative risk is 3.1 for the Maghrebi population, and 1.5 for children under 5 years.

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**PALABRAS CLAVE**

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**Conclusions:** The total incidence of T1DM remains stable, but is higher in the Maghrebi than in the local population, and in children under 5 years compared to 5–18 years group. These results open a study field of which risk factors could be affecting this immigrant population in their destination countries.

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### Alta incidencia de diabetes tipo 1 en población magrebí de Osona y Baix Camp

#### Resumen

**Introducción:** Se ha postulado que la migración podría actuar como factor modificador de la incidencia de diabetes tipo 1 (DM1), por lo que el objetivo de este estudio es determinar si existen diferencias en la incidencia de DM1 según el origen.

**Material y métodos:** Estudio retrospectivo de los casos de debut diabético tipo 1 en menores de 19 años en las comarcas de Osona y Baix Camp entre los años 2000 y 2012, utilizando la historia clínica de las unidades de endocrinología y los datos demográficos del Institut d'Estadística de Catalunya.

**Resultados:** La población infantil en Osona y el Baix Camp aumentó un 36,6%, un 18,9% los autóctonos y un 482% los inmigrantes, a expensas mayoritariamente del colectivo magrebí (90%). Han acontecido 118 debuts diabéticos, 66,9% en nativos, 32,2% en magrebíes y 0,9% en niños de otros países, con una tasa de incidencia total de 14,4 casos/100.000 habitantes/año ( $c/10^5$  h-a). La incidencia es mayor en magrebíes respecto a autóctonos, 37,1 vs. 11,2  $c/10^5$  h-a ( $p < 0,001$ ), y en menores de 5 años respecto a los de 5 a 18 años, 18,9 vs. 12,5 ( $p < 0,05$ ), sin observar diferencias entre sexos ( $p > 0,05$ ). El riesgo relativo es 3,1 para magrebíes y 1,5 para menores de 5 años.

**Conclusiones:** La incidencia total de DM1 se mantiene estable, pero es mayor en magrebíes que en nativos y en menores de 5 años respecto a los de 5–18 años. Estos resultados abren un campo de estudio sobre los factores de riesgo que podrían estar incidiendo sobre esta población en los países de destino.

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## Introduction

In the past two decades, we have experienced large migratory movements in Europe as well as in Spain, leading to an increase in the immigrant population that has been associated with changes in health care. Most of the immigrant population comes from regions with a lower incidence of type 1 diabetes mellitus (T1DM) than that of Spain, so we were interested in analysing the changes in the incidence of this disease in the period corresponding to this spike in immigration, and specifically in two regions in Catalonia: Osona, located inland in a plain 499 m above sea level with continental weather and persistent fog during the winter, and the Baix Camp, at sea level, with a characteristically Mediterranean warmer and sunny weather.

## Materials and methods

We conducted a retrospective study by reviewing the cases of onset of type 1 diabetes in individuals aged less than 19 years in Osona (Barcelona) and Baix Camp (Tarragona) over a period of 13 years (2000–2012), obtaining data from

the medical records of the paediatric endocrinology units of the two regional public hospitals located at the capital of each region: the Hospital Universitari de Vic and the Hospital Universitari Sant Joan de Reus, which are the referral hospitals for all diabetes onset cases in the area. To calculate incidence rates, we obtained demographic data for the general population from the Institut d'Estadística de Catalunya (Institute of Statistics of Catalonia). The incidence rate is the number of new cases relative to the overall susceptible population and is expressed per 100 000 inhabitants (younger than 19 years) per year. We applied a 95% confidence interval to the calculation of incidence rates. We defined T1DM onset and presence of ketoacidosis according to the criteria established by the ISPAD.<sup>1</sup> We compared the data by means of the Student's *t* test, or with the Mann–Whitney *U* test if the size of the compared subsets was small. The level of statistical significance was set at 0.05. The relative risk (RR) was calculated as the ratio of the incidence of T1DM onset and the population under consideration. We expressed metabolic control, assessed by the level of glycated haemoglobin (HbA1c), as the mean HbA1c level for the last two years. We performed the statistical analysis with the software SPSS version 21 (IBM).

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