

EDITORIAL

Change over time in the incidence of type 1 diabetes mellitus in Spanish children[☆]



Evolución de la incidencia de la diabetes mellitus tipo 1 en edad pediátrica en España

Yeray Nóvoa Medina

Unidad de Endocrinología Pediátrica, Hospital Universitario Materno-Infantil, Las Palmas de Gran Canaria, Spain

The last few decades have been characterized by great technological advances in the management of type 1 diabetes mellitus (DM1), as well as the creation of registries, associations and international multicenter studies seeking to improve our knowledge of the epidemiology and of the factors capable of influencing the appearance of the disease.

The creation of international registries (EURODIAB, DIAMOND, SEARCH) has revealed considerable variations in both the geographical area and periods of time regarding the reporting of cases in the developed countries, with incidences ranging between 0.1 and 1.5/100,000 in China and Japan¹ to 60/100,000 in Finland.² These registries have also identified a rise in the incidence of the disease,³ with increments of 3.4% annually for the period 1989–2008 in Europe³ and 2.7% annually for the period 2002–2009 in the United States.⁴ A number of collaborative studies have been developed with the purpose of identifying the environmental and genetic factors which are responsible for DM1 (or which afford protection against the disease). The Diabetes Autoimmunity Study in the Young (DAISY),⁵ in the United States, and its international extension in the form of the Environmental

Determinants of Diabetes in the Young (TEDDY) study,⁶ have been designed to identify the environmental factors capable of predisposing to, or protecting against, autoimmunity and DM1. The Type 1 Diabetes Genetics Consortium is another international project created to identify the genetic factors influencing the appearance of DM1.

The study of such environmental and genetic factors is of great importance considering the increase in incidence of the disease observed worldwide over the last 20–30 years. Such variations are unlikely to be attributable to changes in the genetic bases of DM1, given the short period of time involved, and are probably related to exposure to different environmental factors. These factors are difficult to identify, since they are not a direct cause of the disease, i.e., the mere presence of a factor does not directly trigger the appearance of the disease. Identification requires a large number of patients in order to secure the statistical power needed to detect such secondary influences.

No national registries are currently available in Spain. The first study to provide incidence data from a regional registry was published in 1990 by Serrano-Ríos et al.,⁷ and focused on the incidence of DM1 in the Community of Madrid during the period 1985–1988. Other regional registries have since been created, though with no unifying initiatives and covering different time periods and using different methodologies. To date, the Catalan registry has been the Spanish reference for international registries, though

[☆] Please cite this article as: Nóvoa Medina Y. Evolución de la incidencia de la diabetes mellitus tipo 1 en edad pediátrica en España. Endocrinol Diabetes Nutr. 2018;65:65–67.

E-mail address: yeraynm@hotmail.com

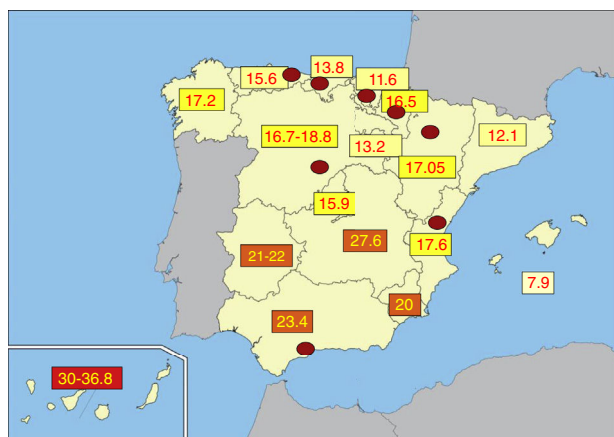


Figure 1 Map of the incidence of DM1 in Spain.

the figures it offers (about 12/100,000) is not fully representative of the situation in Spain. The mean incidence in Spain is approximately 17.7/100,000 inhabitants <14 years of age,⁸ with figures that range between 7.9/100,000 reported for the Balearic Islands⁹ and 30–36/100,000 in the Canary Islands^{10,11} (including non-published data from Dr. Juan Pedro González, of Hospital Universitario de Canarias, on the island of Tenerife). Fig. 1 shows the distribution of the incidence of DM1 in Spain corresponding to the latest published time periods in each region. An increasing trend in the mean incidence can be clearly observed as we move south within the country. This gradient has not been linked to any factor to date, and is in contraposition to the classically described north–south gradient in Europe (with a higher incidence in the northern countries).

With regard to the trend in the appearance of cases in Spain, different studies over the last 30 years suggest an increasing trend in some regions, particularly in those with a larger number of registered years. Considerable variability in both geography and time has also been reported, in coincidence with the findings at international level. The first publications on the incidence of DM1 in Spain referred to the region of Navarre, and date back to the 1970s. Studies in the Basque Country and in Málaga were also carried out in the late 1970s and early 1980s. On comparing these data with the incidences published in recent years for these same regions, an increase with respect to the early figures can be observed. Other Spanish regions, namely Valencia, Aragón, Cantabria and Salamanca also show an increase in incidence in the studied periods. (These regions, along with Navarre, the Basque Country and Málaga, are marked with a red circle in Fig. 1.) Recent findings from Asturias, based on epidemiological data on individuals under 40 years of age in the period 2002–2011 (Dr. Menéndez-Torres et al., published in this number of *Endocrinología, Diabetes y Nutrición*), also describe a slight increase in incidence in the pediatric population. Based on the existing information, and considering that these regions represent 26.3% of the Spanish pediatric population (data obtained from the Spanish National Institute of Statistics),¹² it is difficult to classify the phenomenon as being of a global nature in this country. Fig. 2 shows the regional variations in the periods of time that were studied.

To illustrate the difficulty of detecting trends in the absence of a large number of patients, the evaluation of incidence in the Canary Islands¹⁰ revealed one of the highest rates in Spain, though the number of patients involved (30–35 subjects per year during a 9 year period) only allowed us to detect a significant increase in incidence with a statistical power of 70% if that increment were at least 9–10

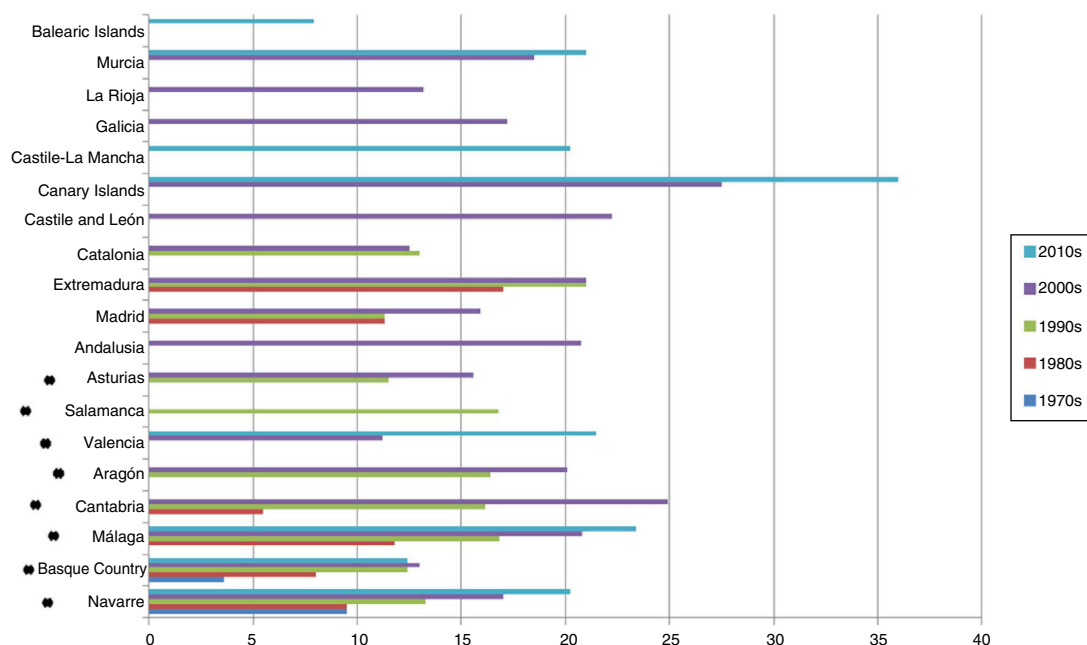


Figure 2 Time variation in the incidence of DM1

● Regions with a significant increase in incidence.

cases/100,000 inhabitants. In our study there were no significant variations in incidence during the evaluated period.

What is the purpose of developing unified national or international registries? Who should promote their development and monitor their course over time? It is important to remember that the absence of a statistically significant trend can mean that such an increasing trend does not exist, or it can imply that the number of studied patients is too small to allow for the detection of the trend. Remedying the lack of a unified registry in Spain by eliminating time variability in data collection and making its collection uniform represents the first step toward making comparisons among the different regions possible and allowing us to study the possible influence of local predisposing or protective factors. The need for such a unified registry is increasingly clear both for improving our knowledge of the true situation of the disease at national level and for facilitating our integration within international networks that can undertake more in-depth exploration of the disease itself. This approach is the only way to ensure adequate healthcare planning and to adopt preventive measures in what we hope will be the not too distant future.

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