

## OBSERVATIONS

## Incidence of Type 1 Diabetes Has Doubled in Rome and the Lazio Region in the 0- to 14-Year Age-Group: A 6-Year Prospective Study (2004–2009)

Incidence of type 1 diabetes is rising, especially among younger children (1,2). We evaluated type 1 diabetes incidence in the years 2004–2009 among subjects <15 years of age residing in Rome and in its region (Lazio). Primary ascertainment was based in diabetes clinics and specialized hospitals, whereas secondary independent ascertainment was from the archives where all patients register to receive free medications within the National Health System.

We identified 666 subjects (369 males and 297 females) with type 1 diabetes (American Diabetes Association criteria diagnosed by a pediatrician/diabetologist). All but 10 patients (1.5%) were Caucasians; 95% of patients tested positive for at least one autoantibody (insulin autoantibody, GAD antibody, or insulinoma-associated protein 2 [IA2]), 175 children (26.3%) were younger than 5 years; 245 (36.8%) were 5–9 years of age; and 246 (36.9%) were 10–14 years of age. Overall type 1 diabetes incidence was 15.68 new cases  $\times$  100,000 inhabitants <15 years of age  $\times$  year (95% CI 12.9–18.9). No significant differences by sex were found (16.09/100,000/year; 95% CI 12.35–20.62 in males; 15.25/100,000/year; 95% CI 11.53–19.82 in females;  $P = 0.76$ ). The annual incidence rate was slightly higher in the 5- to 9-year age-group, but the difference did not reach statistical significance. Conversely the incidence in the 0- to 4-year group was significantly lower than that of the other groups. A sex-related difference in incidence was found only in the 10- to 14-year age-group with a significantly higher incidence in boys (18.77 vs. 14.7;  $P = 0.015$ ).

An initial incidence peak was found

in 2004 ( $17.3 \times 100,000$ ), but the annual incidence rate remained essentially stable during the following 5-year observation. Taking into consideration this finding, we studied the temporal incidence trend by both analyzing the entire 2004–2009 database and excluding data from 2004. When analyzing the 2004–2009 dataset, an annual decrement was evident from baseline. On the other hand, when analyzing the 2005–2009 dataset, a slight increment of about 1.5% per year was evident with the exception of the 5- to 9-year age-group, which showed an annual increase when analyzing the 2004–2009 period and an annual incidence substantially stable in the years 2005–2009. The results of the trend analysis did not reach statistical significance. The onset of type 1 diabetes was significantly more common during autumn (30.3% of cases) and winter (28.7%) and less frequent in spring (21.3%) and summer (19.7%). No sex-related difference in incidence was evident in the different seasons.

When type 1 diabetes incidence was compared with the incidence previously reported in the same region, it was found to have almost doubled (15.68 new cases per 100,000  $\times$  year vs. 7.9 and 8.8 as described in the years 1989–1993 [3] and 1990–1999 [4], respectively). In contrast with our previous data, we found a significantly higher incidence rate in males in the 10- to 14-year age-group, but the maximal peak incidence was still observed in the 5- to 9-year age-group.

In conclusion, our data add strong evidence that type 1 diabetes is increasing among children residing in the Lazio region. This increase is similar in pattern and magnitude to the one reported over the past two decades by most European studies (5).

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