# Early Onset Insulin-Dependent Diabetes Mellitus (before 5 years old) Surveillance in Portugal (2001-2003)

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**Context:** **The incidence of Type 1 Diabetes Mellitus (DM1) in children < 5 years old seems to be increasing in several countries. The reason is still obscure *(Svensson et al, Diabetes Care 2002;Charkaluk et al, Pediatric Research 2002)*. This age group includes very rare situations: a) Transient neonatal DM1 ( $1/10^5$ – $5/10^5$, SGA, 1st-6th week, 25% isodisomy of chromosome b) DM1 in children < 1 year (no β-cell autoantibodies, no measurable C-peptide in response to glucose, 35% *de novo* mutations in the gene encoding Kir 6.2) *(Gloyn et al, NEJM 2004)*.**

**Objectives:** **To collect data on the epidemiology of DM1 in children <5-years-old, in order to get clues to understand its aetiology.**

**Methods:** **Since April 2001, the PPSU national, active, voluntary surveillance system is used for monthly reporting of this condition. Notification cards are monthly sent to circa 1600 paediatricians, attending circa 1,5 million children and adolescents. The mailing list was increased with Endocrinologists who attend children. A specific inquiry on epidemiology and clinical data confirms reported cases. Results to December 2003 are presented (33 months of surveillance).**

**Results:** **Through December 2003, 139 cases were reported (circa 50/year), 59 cases are already confirmed (11 are duplicate or misreported cases, due to overage or non-resident cases).**

## DIAGNOSIS

Where ?
- Hospital (52%)
- Office (36%)
- Health Centre (8%)

Who?
- Paediatrician (85% )
- General Practitioner (10% )
- Endocrinologist (2%)
- Internist (2% )
- Family (2%)

When?
(after presumed onset)
- Two weeks (67%)
- Before 1 week (25%)

First diagnosis
- DM 1 (83%)
- Urinary infection (8%)
- Respiratory infection (5%)
- Otitis (5%)

## CLINICAL FEATURES (presentation)

- Thirst (polydipsia) 98%
- Polyuria 93%
- Weight loss 76%
- Decreased activity 42%
- Altered consciousness 10%
- Fever (opportunist infection) 7%
- Ketoacidosis 32%

Logistic regression analysis isolated hyperglycemia as the main risk factor for ketoacidosis, excluding age, disease duration or socio-familiar data

## COEXISTING CONDITIONS

One 21 Trisomy; no other neonatal pathology associated

Prevalence of Asthma 19%
" Rhinitis 11%
" Eczema 11%
" Recorrent respiratory infections 46%

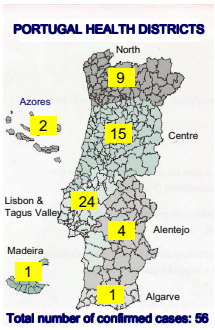
Previous stress 20% psychological (80%)
(mainly parents separation)

## DIABETES MELLITUS AMONG RELATIVES

DM Type 2
Mother family: 26%
Father family: 15%
Both families: 17%
DM Type 1
2 Fathers: 4%

62%

One Gestacional DM



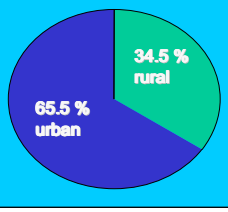

**National and Regional Incidences of Reported Cases**

| AHR | cases | pop<5years | cases/year | incidence* | RHA/Port |
|---|---|---|---|---|---|
| Portugal | 56 | 566500 | 20,4 | 3,6 | 1 |
| Norte | 9 | 214250 | 3,3 | 1,5 | 0,4 |
| Centro | 15 | 86200 | 5,5 | 6,3 | 4,1 |
| LVT | 24 | 191500 | 8,7 | 4,6 | 0,7 |
| Alentejo | 4 | 23250 | 1,5 | 6,3 | 1,4 |
| Algarve | 1 | 20500 | 0,4 | 1,8 | 0,3 |
| Açores | 2 | 16000 | 0,7 | 4,5 | 2,6 |
| Madeira | 1 | 15000 | 0,4 | 2,4 | 0,5 |

AHR - Administrative Health Region

* :100.000

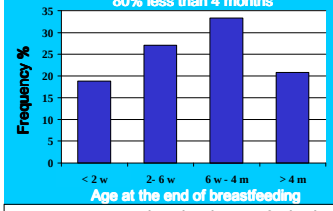
## Residencial Context



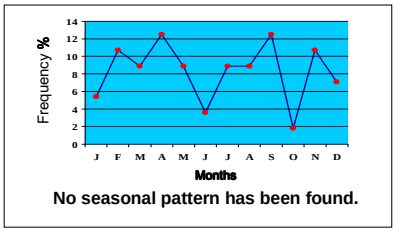

The proportion of cases from rural areas (34,5%) is higher than expected by the national distribution of the population. Regular use of water from wheals or fountains was usual on rural cases (circa 22,2%), arising **suspicion of nitrate contaminated water sheets**.

## BREASTFEEDING

80% less than 4 months

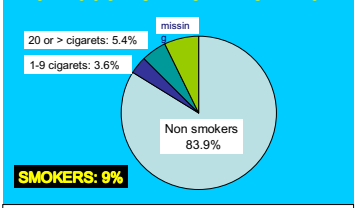



Cases were shortly breastfed than national average .




No seasonal pattern has been found.

## TOBACCO DURING PREGNANCY




Tobacco comsumption during pregnancy was lower than expected for the average national female population of the same age.

**Discussion:** **The high proportion of missing inquiries may affect the results. Regional asymmetries may be due to underreporting, but we cannot exclude they are due to real environmental or population differences. We found clues of potential interaction among environmental, toxic and immunity factors associated to DM1.**

**Conclusions:** **Data from national surveillance may provide clues for the aetiology of DM1 to be followed on later studies. Joining efforts among different surveillance programs will be useful to get more powerful associations that would eventually lead to future preventive or curative interventions.**