OBSERVATIONS

# Campaign for Diabetic Ketoacidosis Prevention Still Effective 8 Years Later

Diabetic ketoacidosis (DKA) in children with type 1 diabetes at onset is considered an increased risk factor of death and is generally related to a long duration of misdiagnosed hyperglycemia-associated symptoms (1). Shortening this latency period could be a winning preventive strategy. In the period of 1991–1997, we investigated this hypothesis in the province of Parma and demonstrated that, thanks to a school and physician campaign centered on the earliest symptom of diabetes (nocturnal enuresis in a "dry" child) as reported by 89% of parents, it was possible to prevent DKA (2). The key success of this campaign was due to a poster showing a child sleeping (potentially wetting the bed) as well as five attractive messages for parents: "Does your child drink and urinate more than usual? Has he started wetting the bed again?. . . Make sure he does not have high blood glucose levels. . . Call your Pediatrician today. Children can also have diabetes." Eight years after the publication of the results from this campaign, newly diagnosed type 1 diabetes from the same area was retrospectively investigated in order to verify whether the campaign was still effective.

From 1 January 1999 to 31 December 2006, 167 children with newly diagnosed type 1 diabetes were admitted to our department. Of these children, 32 (22 girls 7.8 ± 1.6 years of age) were from the province of Parma, where a prevention program for DKA had been promoted (group 1) and 42 (19 girls 8.2 ± 1.4 years of age) were from the two nearby provinces (group 2, control) in which no campaign had been performed. Moderate (pH <7.2, bicarbonate <10 mmol/l) or severe (pH <7.1, bicarbonate <5 mmol/l) DKA was found in 5 (15.6%) and 34 (80.9%; $P < 0.002$) children in groups 1 and 2, respectively. The DKA episodes in group 1 were observed in 2004 ($n = 1$), 2005 ($n = 1$), and 2006 ($n = 3$). No patients with DKA from group 1 were admitted in the period of 1999–2003. The duration of symptoms before diagnosis was 4.5 ± 3.5 and 16.0 ± 8.0 days ($P < 0.0001$) in groups 1 and 2, respectively. Almost all parents from both groups reported an unusual enuresis in their children, but only the parents (81%) from group 1 promptly consulted a pediatrician following the messages displayed in the poster.

Today's data show that the campaign for DKA prevention is still effective in Parma's province 8 years after it was promoted and confirm that enuresis is the most important warning symptom for the early diagnosis of type 1 diabetes. DKA episodes observed in the patients from group 1 in the period of 2004–2006 are a sign that the campaign should be periodically renewed (possibly every 5 years) in order to maintain effectiveness.

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