Even in young type 1 diabetic adults treated with pumps, smoking is associated with worse metabolic control

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Background

Long-term studies over 2 years in young diabetic patients are rare. Some authors have reported results on the evolution of classical criteria, taking account of a transition process or not. To our knowledge, no studies have evaluated the impact of smoking on metabolic control in young patients treated with pumps compared with MDI.

Patients and Methods

We retrospectively investigated a cohort of young type 1 diabetic patients followed in the same hospital from 2007 to September 2016, first in a pediatric and then adult department. A transition process was implemented in 2011. We evaluated several parameters, in particular the impact of drugs on glycemic control. Statistical analysis were performed with Stats view 10.0. Chi 2, Mann-Whitney and Fischer tests were used with significance set at $p \leq 0.05$.

Results

Since 2007, we have followed 48 patients for a median duration of 4.47±3.15 years. Of these, 23% had a transition process between the pediatric and adult team. Mean age at the time of the process was 18±0.98 years with a mean duration of diabetes of 8.46±4.34 years. At this moment, there were not differences between the two groups (transition/no transition) in terms of sex, type of treatment (pumps/MDI), high school status, metabolic control and the number of hospitalizations for acute metabolic complications. We noticed 10.4% of patients lost to follow-up. At the time of the study (T1), regarding glycemic control and addictions, we found a higher HbA1c in patients who had smoked and in those who were admitted for acute metabolic disorders (18/48). A few of these subjects were hospitalized several times. The type of treatment did not influence the result. There was a trend towards better metabolic control in young diabetic patients who had successfully completed high school (data missing for one patient 25/47). The table and figures illustrate the principal findings.

	Transition		High School diploma		Sex		Addictions			Type of treatment		Acute metabolic complications		
	Y:11	N:37	Y:25	N:22	F:20	M:28	Y:11	N:37	p	P:31	MDI:17	Y:18	N:30	p
HbA1c T1 (%)±sd	8.86 ±2.59	8.59 ±1.99	8.16 ±1.84	9.21 ±2.34	8.53 ±2.01	8.74 ±2.21	10.36 ±2.33	8.15 ±1.76	0.0056	8.51 ±1.9	8.9 ±2.49	9.39 ±2.22	8.05 ±1.79	0.05

Table 1: Mean results at the end of the study in young type 1 diabetic patients followed in the same center, with and without a transition process
Y: Yes; N: No; F: Female; M: Male; P: Pump; MDI: Multiple Daily Injections.

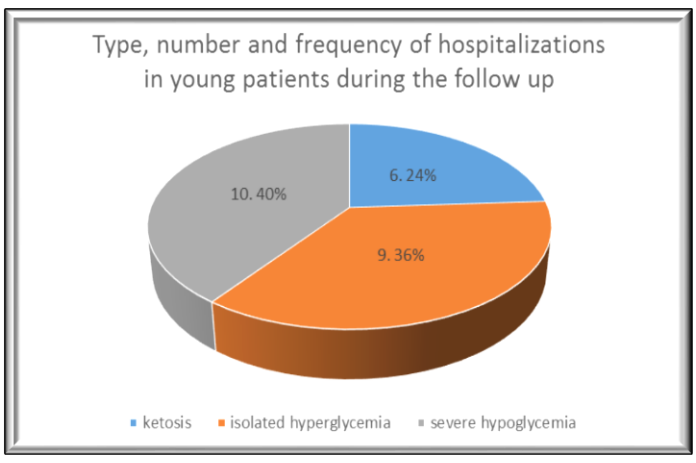

Figure 1

Twenty-five hospitalizations in the 18 subjects during a mean follow-up of 4.47±3.15 years.

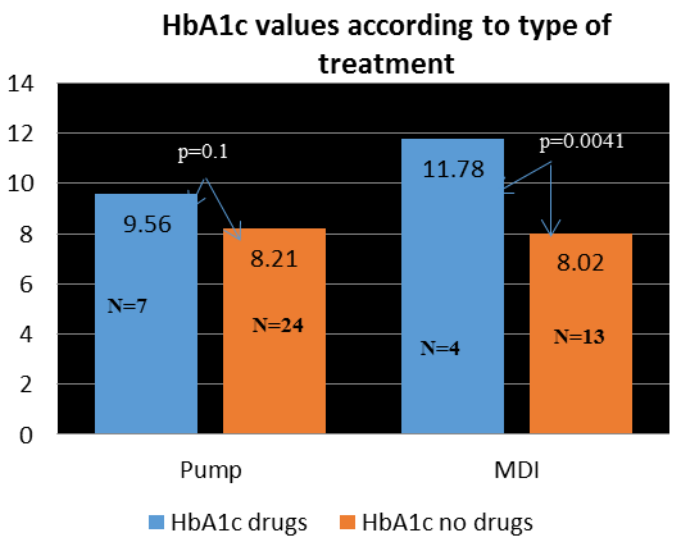

Figure 2

HbA1c levels in patients treated with pumps or MDI at the end of the study taking into account drug status (Tobacco principally).
Eleven patients had taken drugs during the study; 2/11 also used alcohol and/or cannabis.

Conclusion

In our study, tobacco use in diabetic teenagers was strongly associated with increased HbA1c and more hospitalizations for hypoglycemia or ketoacidosis, even in patients treated with pumps. Although we know that pump treatment often improves adherence in teenagers, our study showed that in patients who smoked, the pump did not seem to be sufficient to achieve correct metabolic control. Endocrinologists for pediatric and adult populations need to improve information about the deleterious effects of tobacco and to promote educative actions to encourage young patients to stop smoking before the transition process or after.