

Background:

C-peptide secretion is the most accurate measure of residual β -cell function in type 1 diabetes (T1D) and even residual levels seem to positively correlate with a lower probability of complications.

Aim and Objectives:

To identify key determinants of β cell function decline, measured by fasting C-peptide (FCP).

Methods:

- Prospective study. Evaluation of the FCP of patients diagnosed with T1D, at diagnosis and after 12 months of follow-up.
- The FCP evolution was correlated with age at diagnosis (group 1: ≤ 5 years; group 2: 6-10 years and group 3: ≥ 11 years), autoimmunity, hemoglobin A1c (HbA1c) and presence of ketoacidosis at diagnosis.
- SPSS 22[®] was used for data analysis. A p -value < 0.05 was considered statistically significant.

RESULTS:

Table 1. Patients characteristics at diagnosis

Total patients (n)	20
Sex (♂/♀)	10/10
Age	
Median	8 years
Minimum/maximum	11 months/16 years
Symptom's duration (mean)	24 days
Ketoacidosis (n)	5
Autoimmunity (n)	
GAD ₆₅	9
IAA	5
ICAs	4

Table 2. Patients characteristics by age of onset at diagnosis

	Total	≤ 5 years	6-10 years	≥ 11 years
N	20	6	10	4
Insulin TDD (UI/kg/d) (SD)	0.53 (0.25)	0.52 (0.10)	0.46 (0.30)	0.7 (0.18)
HbA1c (%) (SD)	9.4 (2.28)	8.4 (1.12)	9.5 (2.50)	10.7 (2.90)
FPC (ng/dL) (SD)	0.53 (0.32)	0.50 (0.27)	0.46 (0.31)	0.75 (0.37)

Table 3. FPC variation after 12 months of follow-up

Age group (years)	FPC at diagnosis (ng/dL) (SD)	FPC after 12 M (ng/dL) (SD)	Δ FPC 12 M	p^{**}
≤ 5 (group 1)	0.50 (0.27)	0.19 (0.33)	-0.31	0.030 *
6-10 (group 2)	0.46 (0.31)	0.41 (0.32)	-0.05	
≥ 11 (group 3)	0.75 (0.37)	1.24 (0.45)	+0.49	
Total	0.53 (0.32)	0.51 (0.51)	-0.02	**ANOVA I

Table 4. ANOVA - Multiple Comparisons (Bonferroni)

Groups	P
1 vs. 2	0,77
1 vs. 3	0,03*
2 vs. 3	0,14

Table 5. HbA1c by age of onset at diagnosis and after 12 months of follow-up

	≤ 5 years	6-10 years	≥ 11 years	Total
Diagnosis	8.4 (1.12)	9.5 (2.50)	10.7 (2.90)	9.4 (2.28)
12 months	7.4 (0.57)	7.2 (0.85)	6.7 (1.33)	7.2 (0.87)

Table 6. Comparing FCP variation in patients with HbA1c ≤ 7.5 and HbA1c > 7.5 (Mann-Whitney test)

HbA1c (%)	FPC variation	P
≤ 7.5 %	0.21	0,035 *
> 7.5 %	-0.25	

Table 7. Comparing total daily dose of insulin between patients with HbA1c ≤ 7.5 and HbA1c > 7.5 (Mann-Whitney test)

HbA1c (%)	TDD/kg	P
≤ 7.5 %	0.51	0,035*
> 7.5 %	0.82	

Table 8. Analysis of the association between baseline characteristics and FCP variation (Mann-Whitney test)

	P
Sex	0.631
Ketoacidosis	0.168
Positive antibody (at least one antibody)	0.179

Discussion:

- In our study the FCP level variation was positively correlated with age. The group of patients with ≤ 5 years had a more pronounced loss of pancreatic reserve, translated by the declining value of C Peptide.
- Although implicated as a major factor in β -cell decline in other studies, we found no association between the FCP variation and autoimmunity.
- Our results are limited by the small number of participants. We are proceeding the study with a larger follow-up and more patients enrolled.

