

Improvement in type 1 diabetes mellitus metabolic control: from conventional to functional insulin therapy

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INTRODUCTION

Type 1 Diabetes Mellitus (1DM) is a common chronic disease of childhood with an increasing incidence around the world. The aim of treatment is euglycemia and A1c under 7.5%, if achieved without severe episodes of hypoglycemia (International Society for Pediatric and Adolescent Diabetes - ISPAD). The insulin regimen should be as physiological as possible, considering carbohydrate intake and physical activity, and tailored to each child. Treatment targets the best metabolic control in order to prevent long-term complications.

PURPOSE

To evaluate metabolic control in children and adolescents with 1DM along the years.

MATERIAL AND METHODS

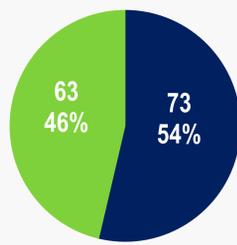
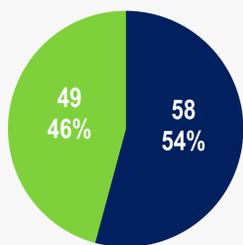
Retrospective study including 1DM children and adolescents with more than two years of disease. Data were collected referring to the years 2005 and 2012: sex, age at diagnosis, therapy in the last year (conventional therapy – CT, and functional therapy – FT, including multiple daily insulin injections - MDII, continuous subcutaneous insulin infusion - CSII), number of group educational sessions, insulin daily dosis (IDD) and mean A1c along last year, body mass index (BMI) and lipid profile. Statistic analysis was done with SPSS 21.

RESULTS

DEMOGRAPHIC CHARACTERIZATION

2005 (N=107)

2012 (N=136)



■ Male ■ Female

	2005 (N=107)	2012 (N=136)	p
Time (years)			
Age at diagnosis	6,0 ± 3,3	6,6 ± 3,6	NS
Age at study	12,8 ± 3,6	12,8 ± 3,5	NS
Duration of 1DM	6,8 ± 3,3	6,2 ± 3,3	NS

	2005 (N=107)	2012 (N=136)
Insulinotherapy		
Conventional	107 (100%)	0
MDII	0	102 (75%)
CSII	0	34 (25%)

EVOLUTION OF THERAPY AND METABOLIC CONTROL

	N=243	2005 N=107	2012 N=136	p
Metabolic control				
A1c mean (%)		8,4 ± 1,1	7,8 ± 0,9	<0,001
Last year's A1c (%)		8,7 ± 1,3	7,7 ± 1,0	<0,001
IDD (U/kg/day)		1,04 ± 0,27	0,91 ± 0,22	<0,001
Educational sessions		1,6 ± 0,9	4,8 ± 2,5	<0,001
Total cholesterol (mmol/L)		4,1±0,82	4,4±0,86	0,01
HDL cholesterol (mmol/L)		1,3±0,45	1,6±0,35	<0,001
BMI sds		0,95±0,84	0,43±1,1	<0,001

	N=243	2005		2012	
		r	p	r	p
A1c and					
- Age at date of study		0,28	0,004	0,18	0,04
- Duration of 1DM		0,25	0,008	0,24	0,005
- IDD		0,41	<0,001	0,30	0,002
- Total cholesterol		0,43	<0,001	0,32	<0,001
- LDL cholesterol		0,27	0,006	0,24	0,005
- FT duration		-	-	- 0,28	0,001

DISCUSSION

In 2005 all children were in conventional therapy and in 2012 all were in functional therapy (75% MDII and 25% CSII)

In both years children with higher A1c

- were older at date of study
- had longer duration of 1DM
- needed higher IDD
- had higher total cholesterol and LDL cholesterol

In 2012 children with higher A1c had shorter duration of functional therapy

Comparing 2005 to 2012

- There were no differences in sex, age at diagnosis or duration of illness
- In 2012 there was
 - Lower mean A1c and A1c in the last year
 - Lower IDD and BMI sds
 - Higher number of group educational sessions
 - Higher LDL cholesterol
 - Higher total cholesterol (p=0,01)

} p<0,001

CONCLUSION

The relevant changes were FT implementation and educational reinforcement. With FT there was better metabolic control with lower insulin dosis and lower BMI. Longest FT was associated with better metabolic control, reinsuring the advantage of intensive insulin therapy since diagnosis.

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