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Efficacy and Safety of CSII Treatment in Pediatric Age: Long Term Experience of a Tertiary Care Centre in Spain

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OBJECTIVES

1. To evaluate the efficacy and safety of CSII treatment in paediatric patients with type 1 diabetes (T1D)
2. To determine ISPAD/ADA criteria for good metabolic control

METHODS

The charts of patients who started CSII over the last 10 years were reviewed. The cohort consisted of 90 patients, age 10.1±4.4 years, 58% males.
We analyzed age at start of T1D, T1D duration, pubertal stage, HbA1c (HPLC-Menarini, normal value 5.1±0.31%), insulin dose decrease (IDd), number of self monitoring blood glucose (SMBG), number of basal rates (BR), % of basal/total insulin (B/TI), insulin to carbohydrate ratio at different meals, severe hypoglycaemic events (SH)/100 patients/year and ketoacidosis events (DKA).
Subgroup analysis based on age and pubertal stage was made. Statistical analysis was performed by SPSS.

RESULTS

Seventy-six and 96% of patients achieved the ISPAD/ADA criteria before and 1 year after CSII, respectively. HbA1c levels decreased to 6.7% after the first year of CSII. Afterwards, levels remained below 7% during follow-up (mean 3.5±1.8, range 1–8 years). Number of SMBG were 8.7±1.7 per day. Number of BR was 5.6±1.8 at 1 year, increasing progressively to 6.7±2.1 at 5 years of treatment with CSII. Insulin ratio at breakfast was higher in all age subgroups. Only two episodes of DKA occurred during CSII follow-up.

	Prior HbA1c	HbA1c (1yr)	HbA1c (4yrs)	Prior SH	SH CSII	IDd (%)	B/TI (% 1yr)	HbA1c<7.5 CSII follow (%)
Total	7.0±0.8	6.7±0.5*	6.9±0.7	18.9	6.9	16	41	91
< 6 yr	7.1±0.8	6.8±0.4*	6.8±0.9	4.8	0	0	35	94
6 yr -Tanner 2	6.8±0.6	6.6±0.5	6.7±0.7	7.1	5.3	16	37	91
≥ Tanner 2	7.1±0.9	6.7±0.5*	7.0±0.6	34.1	12	20	47	91

SH: severe hypoglycaemic episodes. IDd: insulin dose decrease. B/TI: basal/ total insulin dose.

Figure 1. HbA1c values on follow up

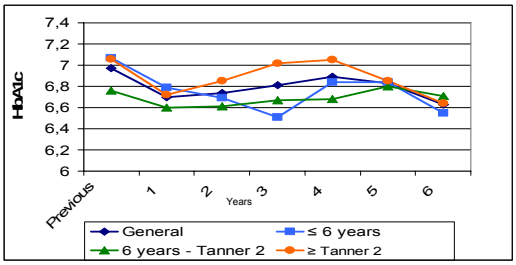


Figure 2. Insulin dose decrease (U/kg/day)

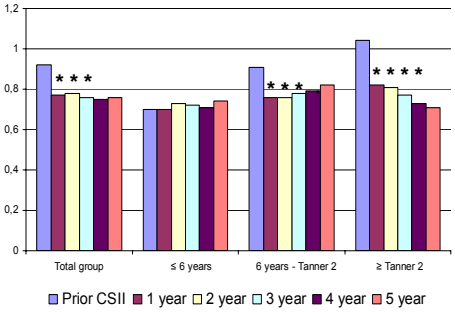
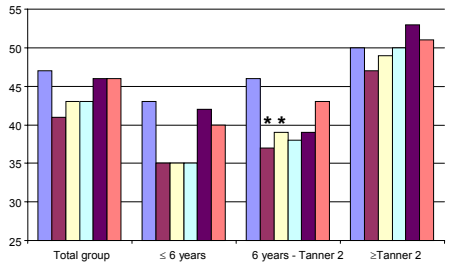
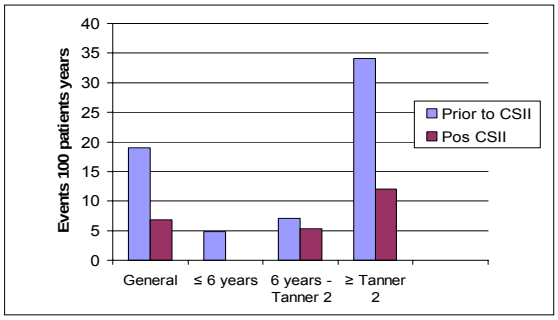


Figure 3. Percentage of basal insulin



* statistically significant

Figure 4. Severe hypoglycemic events during follow up



CONCLUSIONS

1. CSII is effective and safe in the pediatric age.
2. Good metabolic control is achieved and maintained by CSII according to ISPAD/ADA criteria, without increasing adverse effects during long periods of follow up.

[1] International Society for Pediatric and Adolescent Diabetes (ISPAD) Clinical Practice Consensus Guidelines 2014. Pediatric Diabetes 2014:15 (Suppl 20).
[2] Chiang JL, Kirkman MS, Laffel LM, Peters AL. Type 1 Diabetes Sourcebook Authors. Type 1 diabetes through the life span: A position statement of the American Diabetes Association. Diabetes Care 2014;37(7):2034-54.