ROUTINE USE OF SENSOR AUGMENTED PUMP COMPARED WITH INSULIN PUMP THERAPY IN PATIENTS WITH TYPE 1 DIABETES

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INTRODUCTION

Most of the studies evaluating continuous subcutaneous insulin infusion (CSII) and continuous glucose monitoring (CGM) therapies are clinical trials including a selected population, during a short or mid-term period and in within very specific conditions; therefore, they do not usually reflect the routine use of these therapies in real world conditions.

OBJECTIVES

To analyse the real life routine use of CSII therapy with or without CGM and its effectiveness in type 1 diabetic patients (T1D).

METHODS

Retrospective observational cross-sectional study collecting routine use data from T1D patients between January-December 2016. CSII and sensor augmented pump (SAP) users were matched in relation 3:1 paired by diabetes duration and gender. Patients used Paradigm Veo or 640G (Medtronic-Minimed®) devices with a linked blood glucose meter.

Baseline characteristics, metabolic control, device settings and routine use of CSII/SAP were compared.

RESULTS

1. Baseline characteristics

	Total (n=160)	SAP (n=40)	CSII 1(n=120)	P-value
Gender: women (n-%)	88 (55)	22 (55)	66(55)	n.s.
Age (years)	46.7 ± 12.0	45.8 ± 10.5	47.1 ± 12.5	n.s.
Diabetes duration (years)	28.7 ± 9.3	28.8 ± 9.4	28.7 ±9.4	n.s.
Using CSII (years)	10.2 ± 4.7	10.1 ± 5.0	10.2 ± 4.6	n.s.
Main indication for CSII (n-%) **SMC** **Hypoglycemia** **Both** **Pregestational control**	 90 (56.3) 44 (27.5) 22 (13.8) 1 (0.6)	 15 (37.5) 17 (42.5) 7 (17.5) 1 (2.5)	 75 (62.5) 27 (22.5) 15 (12.5) 0 (0)	0.032

* SMC: suboptimal metabolic control; SMBG: self-monitoring blood glucose; BW: bolus wizard.

2. Metabolic control

	Total (n=160)	SAP (n=40)	CSII (n=120)	P-value
HbA1c (%)	7.63 ± 0.83	7.42 ± 0.74	7.70 ± 0.85	0.068
Mean blood glucose (mg/dL)	159.9 ± 31.0	150.8 ± 31.9	162.9 ± 30.2	<0.05
Values >180 mg/dl (%)	35.5 ± 17.1	30.4 ± 18.9	37.2 ± 16.1	<0.05
Values <70 mg/dl (%)	10.3 ± 9.3	11.5 ± 8.0	9.8 ± 9.7	0.320

3. Routine use and device settings of CSII/SAP

	SAP N=40	CSII N=120	P -value
SMBG per day (n)	3.3 ± 1.9	4.4 ± 2.0	<0.01
Total bolus per day (n)	6.2 ± 3.6	4.7 ± 1.6	<0.05
Manual bolus per day (n)	1.4 ± 2.1	0.8 ± 1.5	<0.05
BW over total (%)	74.4 ± 32.7	82.6 ± 27.3	n.s.
BW corrected by the patient (%)	16.3 ± 14.1	20.5 ± 21.8	n.s.
Basal segments per day (n)	6.5 ± 2.1	5.9 ± 1.5	<0.05
Number of basal patterns (n)	1.2 ± 0.4	1.3 ± 0.5	n.s.
BW High glucose target at daytime (mg/dL)	120.3 ± 12.1	121.2 ± 12.3	n.s.
BW Low glucose target at daytime (mg/dL)	95.3 ± 11.0	95.5 ± 11.2	n.s.
BW High glucose target at night (mg/dL)	127.9 ± 12.6	129.9 ± 14.1	n.s.
BW Low glucose target at night (mg/dL)	104.4 ±13.1	104.3 ± 15.8	n.s.
Time of CSII suspension (min/14d)	1362.4 ± 1306.9	134.6 ± 281.1	<0.0001

Sensor use: 64.3% of time

CONCLUSIONS

- In real world clinical practice, SAP therapy is associated with a significant improvement in glucose profile in T1D patients in comparison with CSII.
- More frequent self-adjustments of therapy with SAP may have contributed to these results.