INSULIN PUMP IN SAP-THERAPY WITH PREDICTIVE ALGORITHM IN TYPE 2 DIABETIC INSULIN-TREATED RECIPIENT OF DE NOVO KIDNEY TRANSPLANT

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Background and Aims

Multi-daily insulin injection therapy (MDI) is the standard treatment of insulin-treated diabetes mellitus. Immunosuppressive post-transplant therapy worsens glycemic variability and increases overall post-transplant risk of diabetic, metabolic and cardiovascular complications, reducing graft and patients' survival. We aim to evaluate glycemic and metabolic effects of insulin pump therapy in this class of patients.

Methods

A 68-years old male insulin-treated type 2 diabetic patient with medical history of hypertension, dyslipidemia, diabetic nephropathy end-stage-renal-disease, on hemodialysis for 40 months before kidney transplantation (post-transplant immunosuppressive therapy: cyclosporine, mycophenolate and low dose prednisone). Due to high glycemic variability, poor compliance to MDI and needle-phobia was implanted insulin pump in SAP-therapy with predictive algorithm. Effectiveness of treatment evaluated as comparison between baseline vs 12 months follow-up, by analyzing clinical and biochemical data, continuous glucose monitoring data, diabetes-related complications as need for hospitalization. The patient practiced carbo-counting. SF36 used as a quality of life indicator.

Results

Fasting-glucose:128 *vs* 91mg/dL, HbA1$_c$: 6.4 *vs* 6.1%, glycosuria: 1071 *vs* 94 mg/24h, proteinuria: 189 *vs* 141 mg/24h, eGFR: 70 *vs* 63 mL/min, total daily insulin dose (TDD): 32 *vs* 19.6 ± 0.5 units/die, BMI: 27.7 *vs* 23 kg/m^2, total cholesterol: 184 *vs* 124 mg/dL, triglycerides: 119 *vs* 91 mg/dL. Weekly mean interstitial glycemia: 147 ± 38 *vs* 126 ± 20 mg/dL, weekly mean hypoglycemic episodes: 3 *vs* 0, weekly time spent in hypoglycemia (≤ 70 mg/dL): 1 *vs* 0%, weekly time spent in target (70-140 mg/dL): 44 *vs* 90% **(Fig.1-3)**. Severe hypoglycemia, diabetic-related ketoacidosis and hospitalization were not recorded during all the 12 months follow-up.
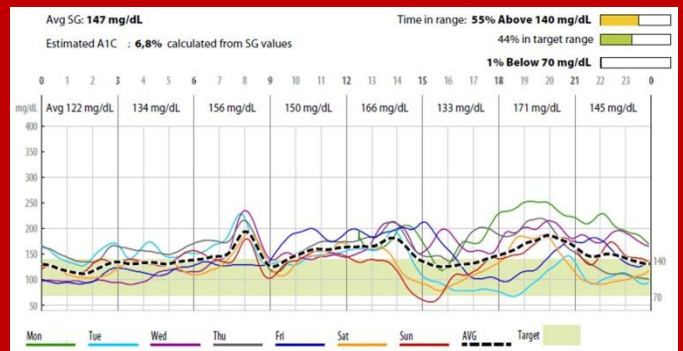

Figure 1. **Blinded CGM in MDI therapy.** Due to corticosteroid effects a worsening of glycemic variability after breakfast and in the afternoon is recorded. Poor glycemic control is noted although estimated glycosylated hemoglobin value of 6.8%.
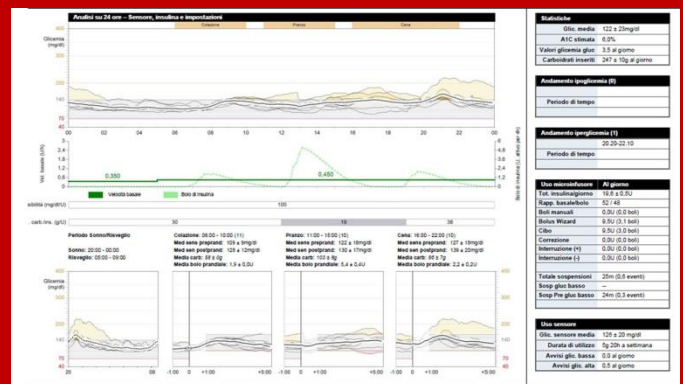

Figure 2. **Real-time CGM during insulin-pump treatment in SAP-therapy with predictive algorithm.** In spite of immunosuppressive therapy a reduction of intra-daily and inter-daily glycemic variability and a good glycemic control is achieved.

Figure 3. **Real-time CGM during insulin pump use in SAP therapy.** The patient practiced counts of carbohydrates and used the bolus calculator.to evaluate preprandial and any correction bolus.

Conclusions

Although the diabetogenic effect of immunosuppressive compounds insulin pump in SAP-therapy with predictive algorithm guarantees an optimal glycemic and metabolic control with increased time spent in target, low glycemic variability, reduced risk of hypoglycemia, better quality of life in diabetic recipient of de novo kidney transplant.