

INTRODUCTION

People with type 1 diabetes receiving chronic haemodialysis face significant challenges. Glucose variability and specific dialysis-induced metabolic changes lead to poor outcomes. We report use of the Medtronic 780G advanced hybrid closed-loop (AHCL) system in a person with type 1 diabetes receiving haemodialysis 3 times a week.

MATERIALS / METHODS

A 48-year-old woman with type 1 diabetes for 27 years, retinopathy with treated maculopathy and end-stage renal disease requiring renal replacement therapy. Following recurrent episodes of severe hypoglycaemia and diabetic ketoacidosis, she started training to use the Medtronic 780G AHCL system with simplified meal announcements. Smartguard target set at 120mg/dL with active insulin time 2 hours.

RESULTS

Table 1: Ambulatory Glucose Parameters after commencing AHCL

	Baseline	7 days	30 days	3 months
Time in Range	48%	66%	76%	
Time below Range	7%	1%	1%	
Coefficient of variation	57.50%	27.70%	27.40%	
Average Sensor Glucose (mg/dL)	198	169	156	
HbA1c	10.30%			7.10%

Figure 1: Ambulatory Glucose Profile (AGP) Pre - AHCL

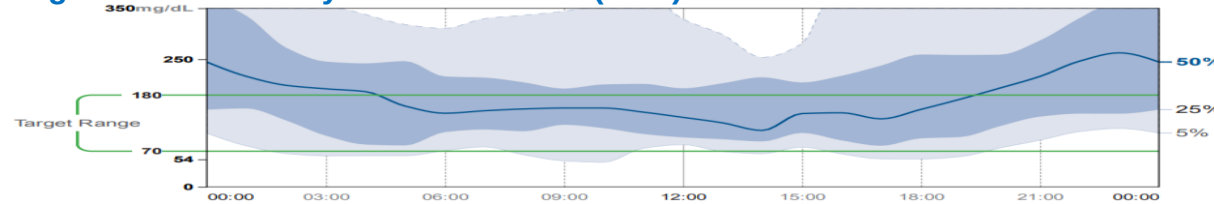


Figure 2: AGP 7 days Post - AHCL

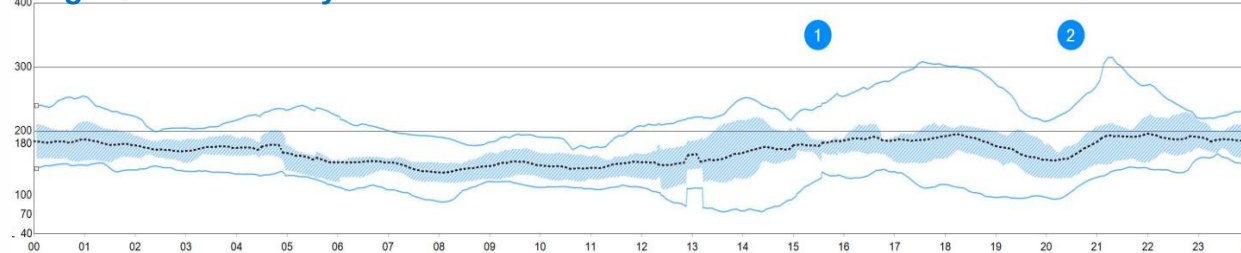
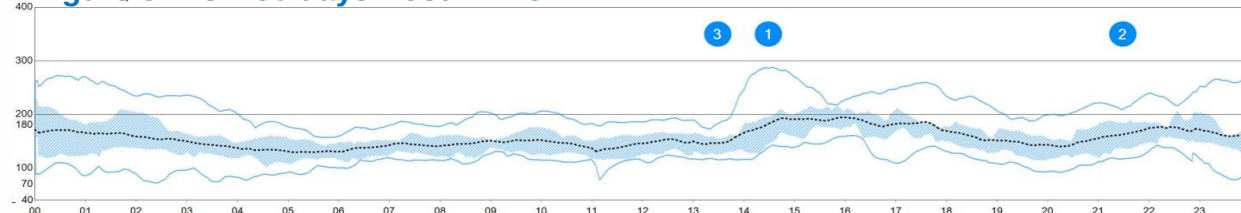


Figure 3: AGP 30 days Post - AHCL



DISCUSSION

On commencing closed-loop therapy, there was sustained improvement in her AGP also seen on her dialysis days. Although she did not use the temporary Smartguard target feature of 150mg/dL on her dialysis days, she still maintained TIR up to 96% without hypoglycaemia. This would suggest the 780G algorithm is able to rapidly adapt to the varied effects of haemodialysis on glucose metabolism.

CONCLUSION

This case demonstrates successful use of the Medtronic 780G AHCL system in a person with type 1 diabetes with end stage renal disease undergoing chronic haemodialysis three times a week. Further research in a larger cohort of patients is required.

REFERENCES

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3. Petrovski G *et al* Diabetes Care. 2023 Mar 1;46(3):544-550