



Reduction of Glycemic Variability by Haemodialysis in Type 2 Diabetes A Pilot Study

A. Proietti¹, A. Daghero¹, J.P. Nogueira², M.L. Iglesias¹, G. De Marziani³, A. Elbert³.

¹Instituto Integral de Diabetes y Tecnología Aplicada, Diabetes

(Institute of Diabetes and Applied Technology), Buenos Aires, Argentina. ²Universidad Nacional de Formosa, Facultad de Ciencias de la Salud (School of Medicine), Formosa, Argentina. ³Centro de enfermedades renales e hipertensión (Center for Renal Disease and Hypertension) Buenos Aires, Argentina

Background and Aims

The HbA1c is a set of parameters of glycemic control in patients with type 2 diabetes (T2D), however this markers do not reflect well glycemic control in T2D patients on haemodialysis (HD). The glycemic variability (GV) could be assessed by continuous glucose monitoring (CGM). The CGM can evaluate the GV by coefficient of variation (CoV) and mean amplitude of glucose excursion (MAGE). We aimed to evaluate the GV by CGM in T2D patients on chronic HD.

Methodology

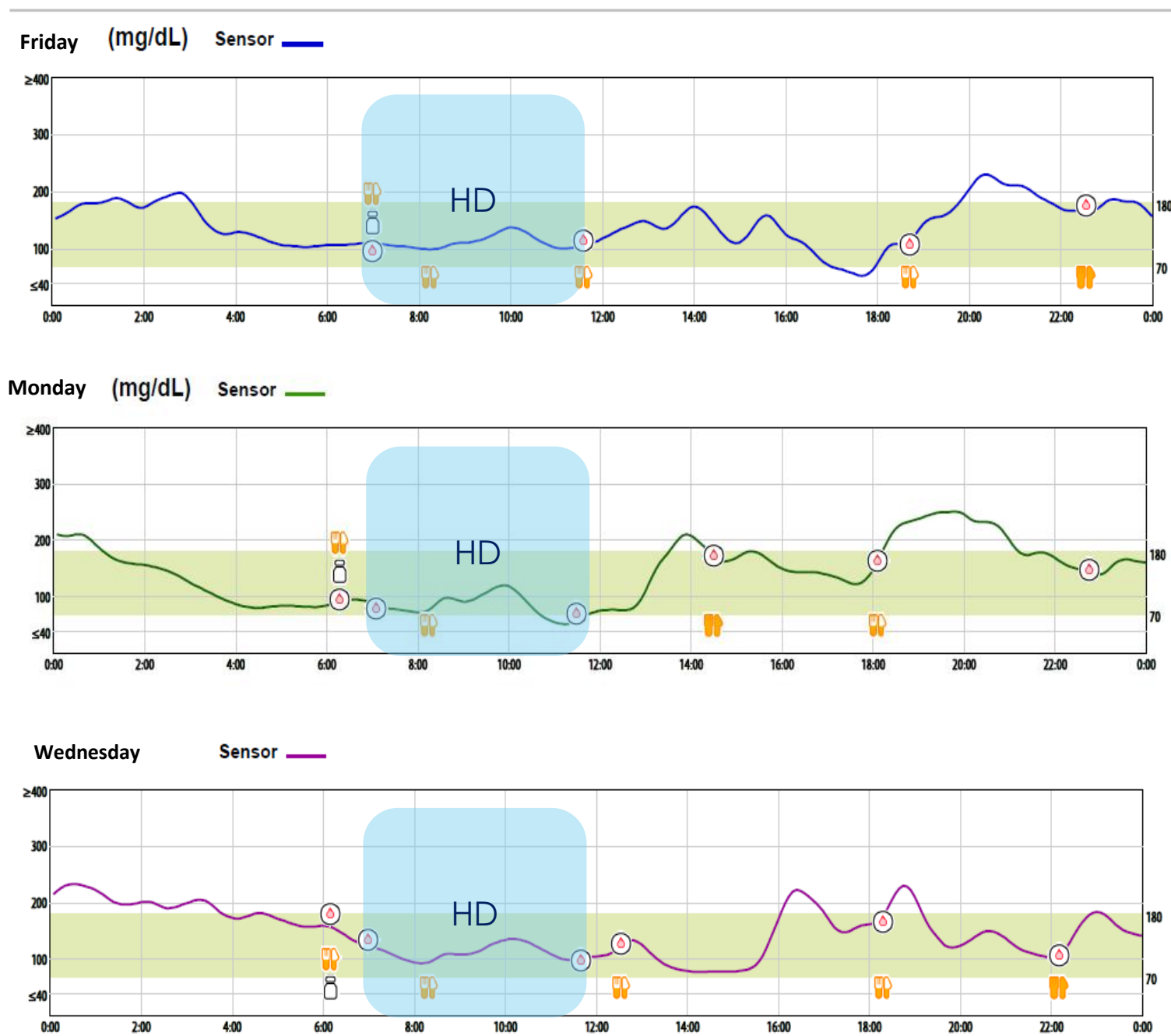
We used a 6-day CGM (iPro2 Medtronic) to monitor glucose levels in 10 HD-T2D patients including 2 days before (PRE-HD), 1 day during (INTRA-HD) and 3 days without dialysis session (POST-HD). The Post-HD period was defined as 8 hours after the end of HD. HbA1c was performed by immunoturbidimetry

Results

T2D duration was 13.9 ± 2.4 (years) and HD duration was 3.7 ± 0.3 (years). The mean of HbA1c was $6.41 \pm 0,2$ %, the CoV mean was 29.6 ± 1.7 % and the mean of MAGE was 267.5 ± 16.7 . We found a reduction of CoV and MAGE between PRE-HD $23.6 \pm 2.6\%$ vs INTRA-HD $13.4 \pm 1.5\%$, $P < 0.01$; PRE-HD 142.4 ± 19.5 vs INTRA-HD 77.1 ± 12.3 , $P < 0.01$; an increase of CoV and MAGE between INTRA-HD $13.4 \pm 1.5\%$ vs POST-HD $24.4 \pm 2.8\%$ $P < 0.05$; 77.1 ± 12.3 vs 145.5 ± 20.1 , $P < 0.05$. (Figure 1 and 2)

The mean of CoV-PRE-HD and MAGE-PRE-HD were correlated positively ($r = 0.87$, $P < 0.01$); the mean of CoV-INTRA-HD and MAGE-INTRA-HD were correlated positively ($r = 0.67$, $P < 0.01$).

No significant association with HbA1c was found.



Graphic 1: glycemic patterns on a patient during PRE HD, INTRA HD, POST HD

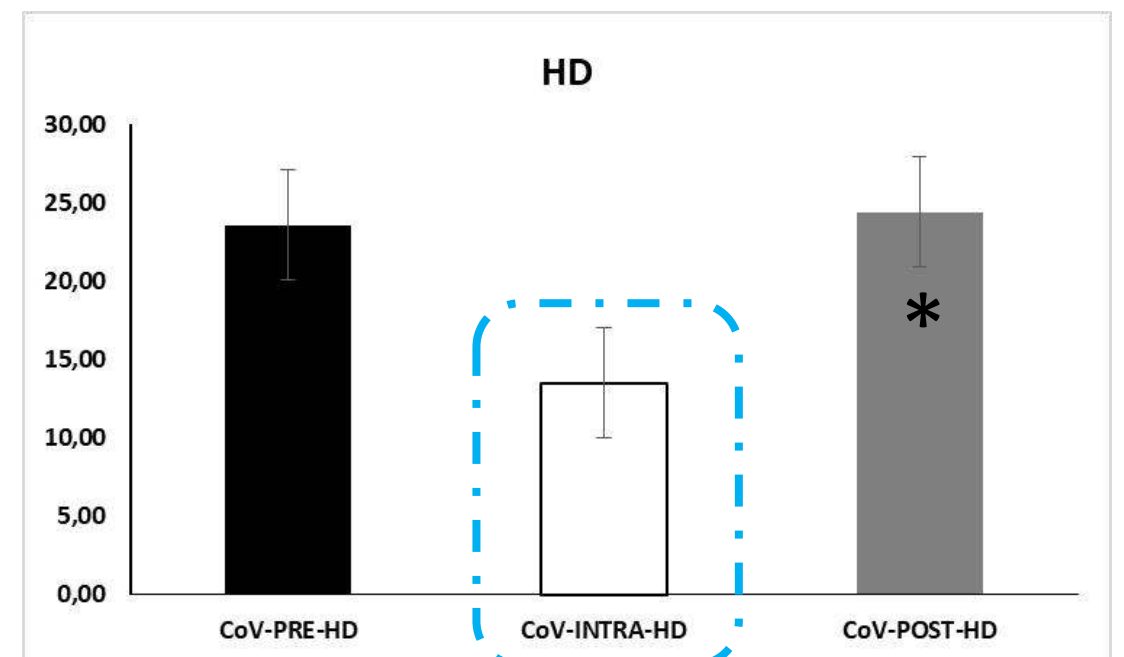


Figure 1: CoV of blood glucose PRE HD, INTRA HD, POST HD

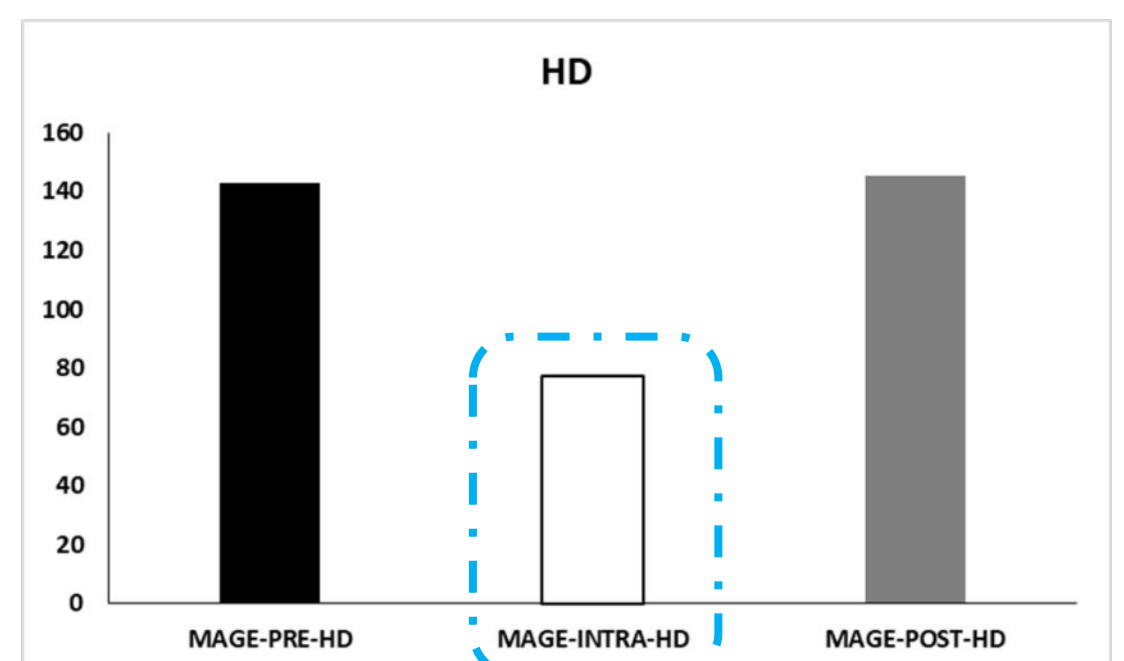


Figure 2: MAGE PRE HD, INTRA HD, POST HD

Conclusion

The HD decreases the GV measured by CGM, with no association with HbA1c. The CGM could be a useful tool to evaluate the GV on HD and optimize treatment for this group of patients because the HbA1c was shown to inappropriately reflect glycemic control. Further studies are necessary to assess whether the CGM can improve metabolic control and related endpoints in haemodialyzed T2D patients.

References:

- 1- J. Riveline et al. Glycemic control in type 2 diabetic patients on chronic haemodialysis: use of a continuous glucose monitoring system. Nephrol Dial Transplant (2009) 24: 2866-2871
- 2- D. Rodbard et al, Continuous glucose Monitoring: A review of recent studies demonstrating improved glycemic outcomes; Diabetes Technology & therapeutics (2017) Vol 19, Suppl 3