

ASSESSING GLYCEMIC CONTROL IN PERITONEAL DIALYSIS DIABETICS: CORRELATING GLYCATED HEMOGLOBIN AND CONTINUOUS GLUCOSE MONITORING.

Ahad Qayyum¹, Stanly L Fan²

1. Joint International Society of Nephrology & Kidney Research UK Fellow at the Department of Renal Medicine & Transplantation, Barts Health NHS Trust, London, UK

2. Department of Renal Medicine & Transplantation, Barts Health NHS Trust, London, UK

OBJECTIVES

To ascertain:

- A correlation between HbA1c and average bloods glucose level as measured by the CGMS
- A correlation between the incidence of hypo & hyperglycemia as reported by the CGMS with HbA1c.

METHODS

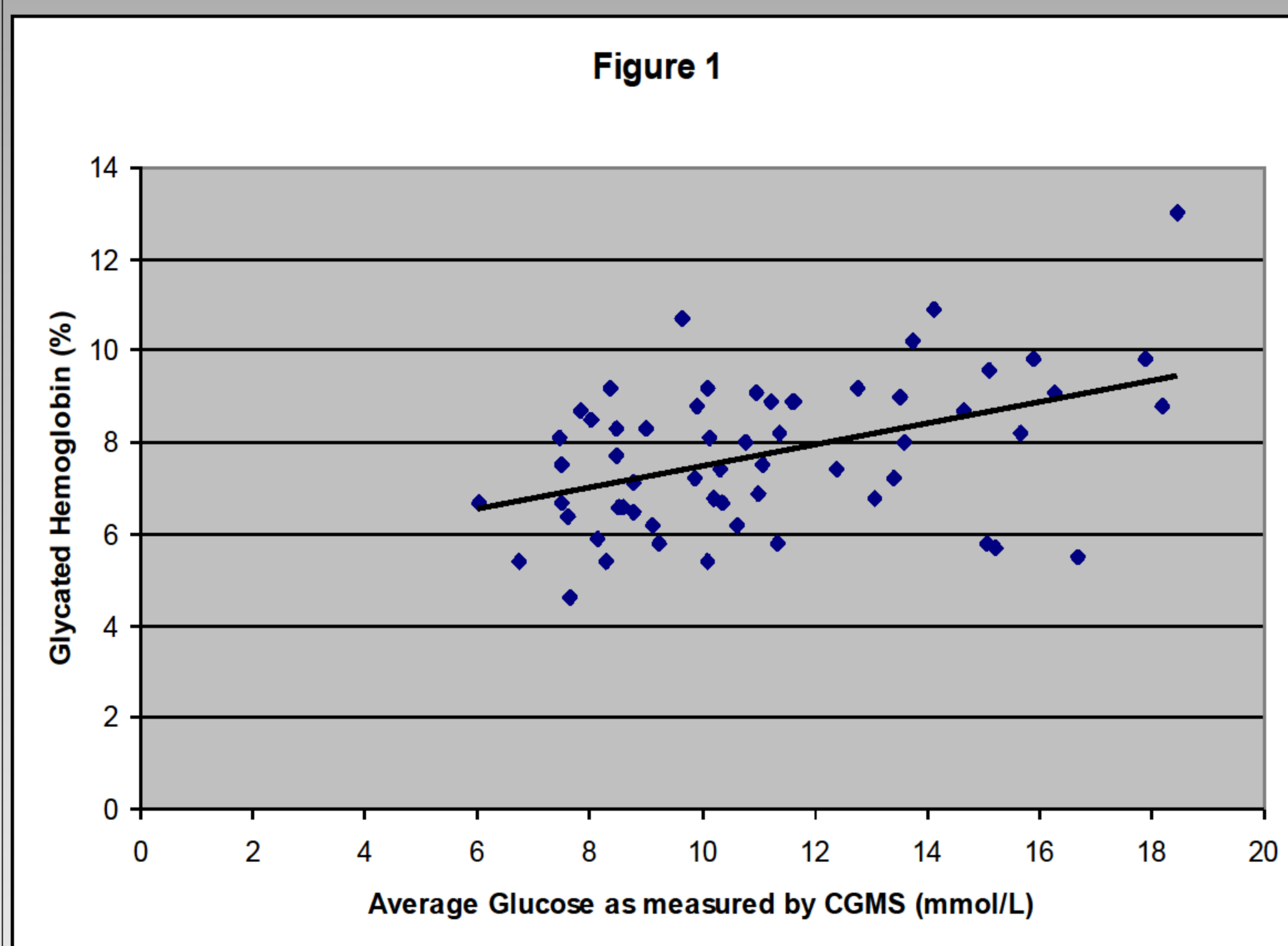
We conducted a retrospective analysis of the first CGMS recording from 60 insulin dependent diabetics (type 1 and 2) who underwent CGMS monitoring for ≥ 5 days and who were on peritoneal dialysis for more than 3 months.

CGMS recordings provided the mean glucose level during the monitoring period. We also determined the proportion of time patients had hypoglycaemia (defined to be a glucose level < 4 mM), hyperglycemia (glucose > 11 mM) and normoglycemia. Details of diabetes therapy, PD prescriptions and pathology results (contemporaneous HbA1c) were retrieved from hospital records.

Karl-Pierson correlation co-efficient was calculated using the Statistical Package for Social Sciences version 17.0 (SPSS 17).

RESULTS

Figure 1: Correlation between glycated haemoglobin and average glucose as measured by CGMS



The mean age of the participants was 60 years with 67% (40) being male and 33% (20) being female. 5 of the participants were type 1 diabetics with the remaining 55 being type 2 diabetics.

The Karl-Pearson correlation co-efficient between HbA1c and the average glucose level was found to be 0.45.

Patients with HbA1c $> 9\%$ (traditionally classified as poor glycaemic control) had significant periods of hypoglycaemia; were hypoglycaemic for an average of 0.8% (12 mins) of their day with 1 patient experiencing 10% (2 hours 24 minutes) per day with glucose < 4 mM (Table1). Patients with HbA1c $< 7\%$ had prolonged periods of hyperglycaemia amounting to almost 8 hours per day (1 patient recorded 90% of their time with glucose > 11 mM).

Table 1: Demonstrates percentage of CGMS recording time spent in hypo and hyperglycemia in relation to HbA1c

HbA1c (%)	Number of Patients	Continuous Glucose Monitoring Results		
		Average Glucose (mmol/L) [Range]	Average Time Glucose < 4 mM (%) [Range]	Average Time Glucose > 11 mM/L (%) [Range]
< 7.0	23	10.0 [6.0-16.7]	2.7 [0-11]	32.9 [0-89]
7.0 – 9.0	25	11.0 [7.5-18.2]	2.0 [0-16]	42.8 [9-95]
> 9	12	13.6 [8.4-18.5]	0.8 [0-10]	63.5 [11-95]

CONCLUSIONS

- HbA1c and average glucose levels measured by the CGMS are only weakly correlated.
- On its own HbA1c as an indicator of glycaemic control in PD diabetics seems inadequate. It does not address acute glucose excursions which are a frequent occurrence in this population group.
- PD patients experience frequent hypoglycaemic episodes and use of CGMS may be particularly helpful when adjusting insulin regimens.

