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# Low interstitial fluid glucose among type 2 diabetes patients with chronic kidney disease; a concern despite appropriate glycated haemoglobin targets

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**Objectives :** Type 2 diabetes (T2D) patients with chronic kidney disease (CKD) require individualised HbA1c targets in addition to continuous glucose monitoring (CGM) or self-monitoring of blood glucose. The study aimed to characterise and compare the burden of Level 1 (<4mmol/l) and Level 2 (<3mmol/l) hypoglycaemia between T2D patients with and without CKD.
**Methods :** T2D subjects with CKD (eGFR <60ml/min per 1.73m$^2$) and without CKD were prospectively recruited from a tertiary-care hospital Diabetes Clinic. Freestyle Libre-Pro sensors were worn for two weeks, and hypoglycaemia events were defined as hypoglycaemia lasting >15 minutes. The number of hypoglycaemic events and intra-day differences in level 1 and 2 hypoglycaemia were studied.
**Results :** 134 subjects were recruited: 74 with CKD (44M:30F) and 60 without CKD (36M:24F) with no significant difference in Hba1c between the two cohorts (66 ± 20 vs 64 ± 16mmol/mol, p>0.05). The CKD cohort was older, had a longer duration of diabetes and a greater proportion on insulin as compared to the non-CKD cohort. The CKD cohort had significantly more level 1, level 2 hypoglycaemia events and glycaemic variability than the non-CKD cohort at 7.6 ± 9.2 vs 4.8 ± 5.4 events/person, 3.3 ± 5.3 vs 1.2 ± 2.0 events/person and 35.3 ± 9.5 vs 32.3 ± 6.8%, respectively with all p-values <0.05. 56.8% of the CKD cohort experienced level 2 hypoglycaemia events despite 71.4% performing capillary blood glucose monitoring (>1 weekly). 90.5% of these patients could not identify such events with significantly more events at night compared to day. In contrast, 50% in the non-CKD cohort experienced level 2 hypoglycaemia events. 93.3% were also unable to identify these events, with no night and day variability.
**Conclusions :** CGM is necessary for T2D patients with CKD to reduce the risk of hypoglycaemic events despite appropriate Hba1c targets. Interstitial fluid glucose targets should be incorporated into guidelines.