**Detecting adverse glycaemic events in hospital with continuous glucose monitoring versus point-of-care testing in people with type 1 diabetes**

**Introduction**

In people with type 1 diabetes (T1D) admitted to hospital, adverse glycaemic events (AGE), comprising both hypoglycaemia and hyperglycaemia, are common and bestow risk for adverse clinical outcomes. People with T1D are increasingly using continuous glucose monitoring (CGM), and ongoing CGM use during admission may provide an opportunity for greater detection of AGE.

**Aim**

We aimed to investigate AGE frequency in hospital, based on CGM versus point-of-care (POC) blood glucose measures.

**Methods**

In this real-world multi-centre retrospective analysis of non-critically ill hospitalised adults with T1D who continued wearing their unmasked CGM (FreeStyle Libre 1/2, Dexcom G5/G6, Medtronic Guardian 3) during admission and received standard ward-based POC testing, we compared CGM- and POC-based AGE detection. Hypoglycaemia and hyperglycaemia were defined as glucose <3.9 mmol/L and >10 mmol/L, respectively. CGM-detected AGE required >15 minutes exceeding threshold criteria; POC-detected AGE was defined if any POC glucose exceeded threshold criteria.

**Results**

In 253 admissions, 127,837 CGM and 5,508 POC glucose measures were analyzed, yielding 1,391 CGM-detected hyperglycaemia AGE and 317 CGM-detected hypoglycaemia AGE.

For CGM-detected AGE with a concurrent POC AGE evident, CGM detected hyperglycaemia a median [IQR] 70 minutes [22,166] before POC and at lower glucose concentrations (10.4 vs 12.4 mmol/L, p<0.0001); and detected hypoglycaemia a median [IQR] 38 minutes [14,65] before POC and at higher glucose concentrations (3.7 vs 3.1 mmol/L, p<0.0001).

For CGM-detected hyperglycaemia and hypoglycaemia AGE, 23% and 25% respectively, were not detected by POC. Only 3% of POC-detected AGE were not detected by CGM.

**Conclusion**

Almost all AGE in hospital were detected by CGM, with few events detected by POC blood glucose monitoring alone. Compared to POC, CGM detected AGE at an earlier timepoint, with a lesser glycaemic extreme. Detecting AGE in hospital appears to be superior with CGM compared to POC glucose alone in people with T1D.