**Exploring the clinical utility of a novel metric of between-day glycaemic variability derived from continuous glucose monitoring: The ST ratio**

**Aim:**

In people with type 1 diabetes (T1D), we have observed clinically from the Ambulatory Glucose Profile that the 5th-95th centile (interventile range [IVR]) can be compared with the 25th-75th centile (interquartile range [IQR]) to reflect less common excursions (ie. “Social events”) versus more frequent variability (ie. “Typical events”) between days. We aimed to quantify this relationship and explore its relationship with other glycaemic metrics.

**Methods:**

We calculated a metric with the formula *(IVR – IQR) / IQR*, across different time periods: total (0000-2400), day (0600-2400), and night (0000-0600). This is coined here as the “ST” ratio. We explored its relationships with other metrics derived from continuous glucose monitoring (CGM) in two different datasets of people with T1D: (i) a randomised, controlled exercise intervention trial in overweight adults, and (ii) a cohort of older adults, half of whom had a recent history of severe hypoglycaemia.

**Results:**

In the former cohort, there was no correlation between total ST ratio and time in range (TIR) at baseline, but there was a positive correlation following exercise intervention (r=0.480, p=0.018). Night ST rose significantly post-intervention (p=0.024). In the latter cohort, total ST was positively correlated with TIR (r=0.320, p<0.001) and negatively correlated with time above range (TAR; r=-0.277, p<0.001). Coefficient of variation (CV), but not ST, was associated with a recent history of severe hypoglycaemia.

**Conclusion:**

ST, a novel metric of between-day variability, can be readily quantitated and is correlated with established glycaemic measures including TIR and TAR. It is a dynamic parameter, modifiable by lifestyle intervention, and is distinct from CV. While further analysis from other datasets is needed to refine its clinical value, including in other types of diabetes, we propose that ST can be added to established CGM metrics which can assist with patient care and reflect causes of glycaemic variability.