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Continuous glucose monitoring (CGM) for 308 older-age participants in an English birth cohort: variability and correlates

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Introduction & Background

Epochs of hyperglycaemia and hypoglycaemia may each increase risk of common chronic diseases and impair both cognitive and physical function even in people without diabetes. Older people may have greater frequency of adverse glycaemic excursions, partly due to disordered autonomic function and sleep quality. Data for older, non-diabetic people are however scant.

Objectives & Approach

1) To describe blood glucose variability (completed) and 2) its socio-demographic and lifestyle correlates in a predominantly non-diabetic cohort of older adults (planned). Participants were recruited during 2021-2023 from an English birth cohort (the 1946 National Survey for Health and Development Study). They wore a continuous glucose monitor (Freestyle libre Abbott), which measured circulating glucose four times/hour, for seven days. Summary statistics and time outside range (4.4-7.8mmol/L) were calculated. Further information on glycaemic excursions and day-to-day variability will be gleaned using the R “*iglu*” package. For all CGM summary and excursion measures, future analyses will investigate: associations with HbA1c, socio-demographics, body composition, physical activity, diet and alcohol use. Results will be stratified by sleep/ wake time periods estimated from simultaneous actigraphy (Philips Actiwatch Spectrum Plus). Sensitivity analyses will exclude people taking hypo/ hyperglycaemic medications and those with diabetes.

Relevance to Digital Footprints

Derived summary measures can be used by future studies to give insights into glycaemic variability as a population-level risk factor. This work will bring together multiple data sources, i.e. from CGM, actigraphy and baseline cohort data.

Results

Participants were aged 75-76 years, 45% female and 10% had diagnosed diabetes; median (IQR) BMI was 26.8 (24.6-29.2) kg/m². CGM data from 308 participants was collected, for a median (IQR) of 6.9 (6.7-7.6) days. Average glucose over the recording period was 5.7mmol/L (5.3-6.2mmol/L), standard deviation was 1.0mmol/L (0.8-1.3mmol/L), time outside range was 12.8% (6.2-24.7%) and 16% of participants spent ± 1 hour/day above and ± 1 hour/day below range.

Conclusions & Implications

CGM was feasible for this cohort of older adults, and demonstrated high levels of time outside range for a predominantly non-diabetic group. Future analysis will determine whether enhanced characterisation of glycaemic variability is a potentially more accurate tool for predicting future disease risk than isolated glucose measurements.

