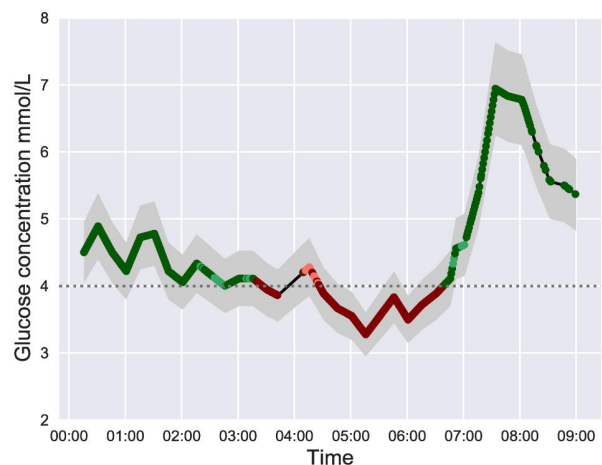


Non-invasive, ECG based low-level glucose detection

Tracking sugar in the blood is crucial for both healthy individuals and diabetic patients. Currently, Continuous Glucose Monitors (CGM) are available by the NHS for hypoglycaemia. They measure glucose in interstitial fluid using an invasive sensor, which sends alarms and data to a display device. In many cases, they require calibration twice a day with invasive finger-prick blood glucose level tests.

The University of Warwick has developed an algorithm that continuously detects low glucose levels using an ECG device.



Technology overview

Researchers at the University of Warwick use artificial intelligence to detect hypoglycaemic events from raw ECG signals acquired using off-the-shelf non-invasive wearable or ambient sensors. Two pilot studies with healthy volunteers found the average sensitivity and specificity with accuracy of approximately 82% for hypoglycaemia detection. This result is possible because the Warwick AI model is trained with each subject's own data. Intersubjective differences are so significant, that training the system using cohort data would not give the same results.

The Market

There are several markets for this technology. Patient populations include those with (1) diabetes (Type I and II) who wish to better manage their treatment, insulin and food levels, (2) pre diabetics, (3) healthy people wanting to monitor their glucose levels e.g. when operating heavy and dangerous equipment, (4) athletes for long distance running, cycling etc., and (5) those wanting to manage their weight.

Diagnostic and monitoring devices for all types of diabetes cost the NHS £181.2m in England during the 2017/2018 period. Worldwide, 16 million rising to 24million people have severe hypoglycaemia, and in the UK alone, severe hypoglycaemia affects an estimated 130k-155k people.

Next Steps

Two pilot trials have been carried out in clinical and non-clinical settings with a total of 33 healthy volunteers, monitored continuously over 24 hours using a CE marked wearable ECG device and with a CGM control. More clinical research is required to confirm these results in wider populations, so the team is looking for partners. They are also making the technology available for licence.

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