An increase in recording interval in continuous glucose monitors results in the identification of fewer hypoglycaemic episodes but interpolation can help to identify some of these missed episodes

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Aims: Continuous glucose monitoring systems (CGMs) have become widely used in clinical practice. Some CGMs provide glucose readings every 5 minutes and others every 15 minutes. The aim of this study was to identify how measurement intervals of 5- and 15-minutes affect common metrics of glycaemic variability and hypoglycaemia and whether interpolation can be used to correct for longer measurement intervals.

Methods: Data from 67 participants' Dexcom G6 CGM, totalling 106 week-long traces, was converted from 5-minute to 15-minute intervals by removing data points. The 15-minute data was then interpolated into 5-minute data to estimate missing data. Common metrics of glycaemic control were calculated to assess agreement of the 15-minute and interpolated 15-minute data to original 5-minute data as gold-standard. Precision, recall, and CSI score were calculated.

Results: Longer sampling intervals reduced the number of hypoglycaemic episodes detected, with 15-minute sampling missing 7.2% of level 1 hypoglycaemic episodes and 10.6% of level 2 hypoglycaemic episodes. Other glycaemic metrics, including time in range, coefficient of variation (CV) and average glucose, were unaffected. Interpolation reduced the number of false negative hypoglycaemic episodes compared to 15-minute data, however led to an increase the false positive identification of episodes, resulting in potential overestimation in the number of hypoglycaemic episodes.

Conclusion: Increasing CGM time interval from 5- to 15-minutes results in missing 10% clinically significant hypoglycaemic episodes. Interpolation of 15-minute data retrieves some missing hypoglycaemic episodes such that only 3% of level 2 hypoglycaemic episodes are missed.