

The Challenges of Measuring Glycemic Variability

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Abstract

This commentary reviews several of the challenges encountered when attempting to quantify glycemic variability and correlate it with risk of diabetes complications. These challenges include (1) immaturity of the field, including problems of data accuracy, precision, reliability, cost, and availability; (2) larger *relative error* in the estimates of glycemic variability than in the estimates of the mean glucose; (3) high correlation between glycemic variability and mean glucose level; (4) multiplicity of measures; (5) correlation of the multiple measures; (6) duplication or reinvention of methods; (7) confusion of measures of glycemic variability with measures of quality of glycemic control; (8) the problem of multiple comparisons when assessing relationships among multiple measures of variability and multiple clinical end points; and (9) differing needs for routine clinical practice and clinical research applications.

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Abbreviations: (CGM) continuous glucose monitoring, (CV) coefficient of variation, (GRADE) glycemic risk assessment diabetes equation, (MAD) mean absolute difference, (MAG) mean absolute glucose rate of change, (MAGE) mean amplitude of glucose excursion, (MODD) mean of daily differences, (SD) standard deviation, (SEM) standard error of the mean, (SMBG) self-monitoring of blood glucose

Keywords: continuous glucose monitoring, glycemic variability, hypoglycemia, quality of glycemic control, self-monitoring of blood glucose

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