

Average Daily Risk Range as a Measure for Clinical Research and Routine Care

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Abstract

There is emerging evidence suggesting that glycemic variability may relate to risk for diabetes-related complications. This article provides a description of average daily risk range (ADRR), a diabetes-specific measure of risk for hyperglycemia and hypoglycemia, and provides a summary of research using ADRR and clinical applications of ADRR. Average daily risk range is a variability metric that is based on “risk” values obtained from glucose levels that are mathematically transformed to give equal weight to hyperglycemic and hypoglycemic excursions. It can be calculated using self-monitoring of blood glucose or continuous glucose monitoring (CGM) data. The ADRR is scored based on risk categories: low risk, 0–19; moderate risk, 20–40; and high risk, 40 and above. Research using ADRR has found it to be a reliable predictor of extreme blood glucose values regardless of diabetes type and patients’ age. Moreover, in treatment studies, ADRR presents as a very conservative measure of variability. Clinically, ADRR can provide meaningful data related to patients’ risk for hyperglycemia and hypoglycemia that is not available from glycated hemoglobin values. Average daily risk range scores may also help clinicians to identify patients who may be overtreating blood glucose levels, leading to very high or low values. To expand the utility of ADRR, future research should examine the validity of existing risk cutoff scores for pediatric patients, determine if ADRR cutoff scores need to be modified for CGM data, and investigate whether patients’ ADRR scores also relate to the development of long-term complications, including retinopathy and microalbuminuria.

J Diabetes Sci Technol 2013;7(5):1370–1375

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Abbreviations: (ADRR) average daily risk range, (CGM) continuous glucose monitoring, (CSII) continuous subcutaneous insulin infusion, (GRADE) glycemic risk assessment diabetes equation, (HbA1c) glycated hemoglobin, (LBGI) low blood glucose index, (MAGE) mean amplitude of glycemic excursion, (MDI) multiple daily injection, (SDT) total standard deviation, (SMBG) self-monitoring of blood glucose

Keywords: average daily risk range, continuous glucose monitoring, glycemic variability, measurement, self-monitoring of blood glucose

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