## Is There a Relationship between Mean Blood Glucose and Glycated Hemoglobin?

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## Abstract

Measurement of hemoglobin A1c (HbA1c) is considered the gold standard for monitoring chronic glycemia of diabetes patients. Hemoglobin A1c indicates an average of blood glucose levels over the past 3 months. Its close association with the risk for the development of long-term complications is well established. However, HbA1c does not inform patients about blood glucose values on a daily basis; therefore, frequent measurements of blood glucose levels are necessary for the day-to-day management of diabetes. Clinicians understand what HbA1c means and how it relates to glucose, but this is not the case with patients. Therefore, the translation of the HbA1c results into something more familiar to patients seemed a necessity.

The scope of this article is to review the literature to search for enough scientific evidence to support the idea of a close relationship between HbA1c and mean blood glucose (MBG), and to justify the translation of HbA1c into something that reflects the MBG.

Most studies confirm a close relationship between HbA1c and MBG, although different studies result in different linear equations. Factors affecting this relationship may limit the usefulness and applicability of a unique mathematical equation to all diabetes populations.

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Abbreviations: (ADAG) A1c-Derived Average Glucose, (BV) biological variation, (CGM) continuous glucose monitoring, (DCCT) Diabetes Control and Complications Trial, (eAG) estimated average glucose, (GHb) glycated hemoglobin, (GV) glucose variability, (Hb) hemoglobin, (HbA1c) hemoglobin A1c, (MBG) mean blood glucose, (MPG) mean plasma glucose, (SMBG) self-monitoring of blood glucose, (T1DM) type 1 diabetes mellitus, (T2DM) type 2 diabetes mellitus

Keywords: diabetes, estimated average glucose, glucose, glycated hemoglobin, hemoglobin A1c, mean blood glucose, mean plasma glucoset

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