

Circulating Biomarkers of Glycemia in Diabetes Management and Implications for Personalized Medicine

Mark W. True, M.D., FACP, FACE

Abstract

Personalized medicine represents a new model in how the medical community approaches disease management. Rather than managing those with a particular diagnosis according to an established guideline, the personalized medicine model seeks to identify unique characteristics within each patient that can serve as a basis for disease characterization and specialized treatment. This article reviews several circulating biomarkers of glycemia that are used in the medical management of diabetes, to include hemoglobin A1c, fructosamine, and 1,5-anhydroglucitol. Within the discussion, specific attention is paid to areas in which biomarker results do not correlate with anticipated results based on actual mean glycemia. Variability between actual and anticipated results of the various biomarker tests represents opportunities to identify previously undefined subcategories of diabetes and groups of patients that fit into these subcategories. Finally, research areas are proposed for these subcategories that would further promote the field of personalized medicine in diabetes.

J Diabetes Sci Technol 2009;3(4):743-747

Author Affiliation: U.S. Air Force Medical Corps, Endocrinology Service, Lackland Air Force Base, Texas

Abbreviations: (1,5-AG) 1,5-anhydroglucitol, (DCCT) Diabetes Control and Complications Trial, (eAG) estimated average glucose, (GG) glycosylation gap, (HbA1c) hemoglobin A1c, (HGI) hemoglobin glycation index, (IFCC) International Federation of Clinical Chemists, (NGSP) National Glycohemoglobin Standardization Program, (SD) standard deviation, (SMBG) self-monitoring of blood glucose

Keywords: 1,5-anhydroglucitol, diabetes biomarkers, glycation gap, hemoglobin A1c variability, hemoglobin glycation index, personalized medicine

Corresponding Author: Mark W. True, M.D., FACP, FACE U.S. Air Force Medical Corps, Endocrinology Service, 59th Medical Operations Squadron, 2200 Bergquist Dr., Ste. 1, Lackland AFB, TX 78236; email address mark.true@lackland.af.mil