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ORIGINAL ARTICLES

Individuals Achieve More Accurate Results with Meters That Are Codeless and Employ Dynamic Electrochemistry

Anoop Rao, M.D.,[1] Meg Wiley, R.N., B.S.N.,[1] Sridhar Iyengar, Ph.D.,[1] Dan Nadeau, M.D.,[2] and Julie Carnevale, M.P.H.[1]

Abstract

Background:

Studies have shown that controlling blood glucose can reduce the onset and progression of the long-term microvascular and neuropathic complications associated with the chronic course of diabetes mellitus. Improved glycemic control can be achieved by frequent testing combined with changes in medication, exercise, and diet. Technological advancements have enabled improvements in analytical accuracy of meters, and this paper explores two such parameters to which that accuracy can be attributed.

Methods:

Four blood glucose monitoring systems (with or without dynamic electrochemistry algorithms, codeless or requiring coding prior to testing) were evaluated and compared with respect to their accuracy.

Results:

Altogether, 108 blood glucose values were obtained for each system from 54 study participants and compared with the reference values. The analysis depicted in the International Organization for Standardization table format indicates that the devices with dynamic electrochemistry and the codeless feature had the highest proportion of acceptable results overall (System A, 101/103). Results were significant when compared at the 10% bias level with meters that were codeless and utilized static electrochemistry ($p = .017$) or systems that had static electrochemistry but needed coding ($p = .008$).

Conclusions:

Analytical performance of these blood glucose meters differed significantly depending on their technologic features. Meters that utilized dynamic electrochemistry and did not require coding were more accurate than meters that used static electrochemistry or required coding.

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Author Affiliations: [1]AgaMatrix Inc, Salem, New Hampshire; and [2]HealthReach Diabetes, Endocrine and Nutrition Center, Hampton, New Hampshire

Abbreviations: (ADA) American Diabetes Association, (BGM) blood glucose meter, (HCP) health care professional, (ISO) International Organization for Standardization, (SMBG) self-monitoring of blood glucose, (YSI) Yellow Springs Instruments

Keywords: accuracy, autocode, blood glucose, blood glucose meter, coded, dynamic electrochemistry, self-monitoring of blood glucose

Corresponding Author: Meg Wiley, R.N., B.S.N., AgaMatrix Inc., 10 Manor Parkway, Salem, NH 03079; email address mwiley@agamatrix.com