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SYMPOSIUM

Analysis of Hemoglobin A1c from Dried Blood Spot Samples with the Tina-quant® II Immunoturbidimetric Method

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Abstract

Background:

Hemoglobin A1c (HbA1c) has been endorsed as a tool for the diagnosis of diabetes. This test requires instrumentation that may not be available in underdeveloped areas. Dried blood spot (DBS) samples collected by finger stick procedures offer a mechanism to transport samples to laboratories that do measure HbA1c.

Methods:

Whole blood (ethylenediaminetetraacetic acid) was applied to Ahlstrom 226 filter paper. These DBS samples were compared to whole blood samples using the Roche Tina-quant® II immunoturbidometric assay. Hemoglobin A1c stability on DBS was assessed at three temperatures—4, 25, and 40°C—for up to 9 days. A 44-day study was also done for DBS at 20–25°C.

Results:

The Tina-quant® II DBS method showed excellent agreement with whole blood HbA1c results (r^2 = 0.99) with a slight positive mean bias of 0.08 ± 0.04% HbA1c (95% confidence interval). The variation in HbA1c on DBS samples subjected to different temperatures and times did not exceed 5.6%.

Conclusions:

Dried blood spot samples represent an alternative to whole blood for HbA1c by measurement when transporting whole blood is not feasible.

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Abbreviations: (%CV) percentage coefficient of variance, (CI) confidence interval, (DBS) dried blood spot, (HbA1c) hemoglobin A1c, (HPLC) high-performance liquid chromatography, (IEC) international expert committee, (MDP) medical decision point, (NGSP) National Glycohemoglobin Standardization Program, (USPS) U.S. Postal Service

Keywords: diabetes, dried blood, glycohemoglobin, hemoglobin A1c

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