

Influence of Variables on Hemoglobin A1c Values and Nonheterogeneity of Hemoglobin A1c Reference Ranges

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Abstract

Introduction:

Hemoglobin A1c (HbA1c) values are influenced by analytical interferences such as HbF and hemoglobin variants and clinical factors such as increased red cell turnover. Although less well-known, demographic factors such as race, age, and sex also influence HbA1c values.

The HbA1c reference range should be homogenous in the United States based on the use of National Glycohemoglobin Standardization Program certified methods and the recommendations in the National Academy of Clinical Biochemistry guidelines.

Methods:

Data on age, race, sex, HbA1c, and glucose values were extracted from the National Health and Nutrition Examination study for a 3 year period. A search for reference range data for laboratories in the United States was performed using the Google search engine.

Results:

Extracted data agree with published data on the influence of age, sex, and smoking status on HbA1c values. There is substantial heterogeneity in HbA1c reference ranges in laboratories in the United States.

Conclusion:

Age, sex, and smoking status influence HbA1c values. Despite standardization of HbA1c methods and published recommendations, there is wide heterogeneity in HbA1c reference ranges in the United States.

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Abbreviations: (HbA1c) hemoglobin A1c, (NACB) National Academy of Clinical Biochemistry, (NGSP) National Glycohemoglobin Standardization Program, (NHANES) National Health and Nutrition Examination Survey

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