ORIGINAL ARTICLE

Falsely Increased HbA1c Values by HPLC and Falsely Decreased Values by Immunoassay lead to Identification of Hb Okayama and Help in the Management of a Diabetic Patient

CHRISTIAN R. FRERS¹, SILVIA DORN¹, WINFRIED SCHMIDT¹, LOTHAR KOCHHAN¹, JOACHIM SIMON-SCHULTZ², RÜDIGER ARNDT¹

¹Labor Dr. Keeser, Prof. Arndt und Partner, Hamburg, Germany
²Praxis für Allgemeinmedizin, Hamburg, Germany

SUMMARY

A falsely increased HbA1c value of 47.1% was determined by cation exchange chromatography during a routine HbA1c measurement of the blood sample from a 63-year-old diabetic male patient living in Hamburg, Germany. In former determinations by immunological assays falsely decreased values in the range of 5.0 to 5.5% were obtained. The sample was inconspicuous in alkaline hemoglobin electrophoresis. But acid hemoglobin electrophoresis confirmed the falsely increased value. These facts let us consider the existence of a heterozygous “silent hemoglobin variant”, such as hemoglobin Okayama, with an amino acid substitution in one of the first four amino acids of the beta chain, representing the epitope of common immunoassays. DNA analyses confirmed this presumption and we found the heterozygous mutation hemoglobin Okayama [B2 (NA 2) His (CAC) → Gln (CAA)]. Knowing that an immunological assay only detects about half of the present HbA1c, the obtained values can be used for therapeutic management of this diabetic patient. (Clin. Lab. 2006;46:569-573)