[Noninvasive blood glucose monitoring: new technology using metabolic heat conformation method].

[Article in Japanese]

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Abstract

Self-monitoring of **blood glucose** has become an essential aspect of management of patients with diabetes mellitus. Although several approaches for noninvasive **blood glucose** monitoring(NIGM) have been proposed including near infrared spectrophotometry. Body heat generated by glucose oxidation is based on the subtle balance of capillary glucose and oxygen supply to the cells. Hence, the **blood glucose** can be estimated by measuring the body heat and the oxygen supply. Development of the **metabolic heat conformation** (MHC) method consists of a sensor pickup and a calibration model. The calibration model incorporates mathematical procedures to process signals from the sensor pickup to final glucose value. The patients group was classified into clusters (calibration functions). Each subject patient was assigned to one of calibration functions. The assigned calibration function for the patient was later used for calculating the glucose values. Regression analysis involving 127 data points at random timing (109 data points from diabetic patients, 18 data points from non-diabetic patients) ranging 54mg/dl to 405mg/dl by the non-invasive method against the hexokinase photometric method for plasma as a reference method was performed. The correlation coefficient (r) was 0.91. Repeatability of the non-invasive method was measured for healthy fasting persons. The standard deviations were ranged from 5 to 6mg/dl around the concentration of 100mg/dl. These data provide preliminary evidence that the MHC method can be used to estimate **blood glucose** concentrations non-invasively.

PMID: 16789424

[Indexed for MEDLINE]

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