

Investigation of Maltose Interference on the Roche ACCU-CHEK Inform II Blood Glucose Meter

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Background: Maltose can be present in the blood of patients who were treated with peritoneal dialysis using icodextrin or maltose-containing immune globulin up to 2 weeks after the treatment. Maltose can interfere with glucose measurement using glucose dehydrogenase pyrroloquinolinequinone (GDH-PQQ) and cause falsely elevated glucose results. Patients can develop severe hypoglycemia if treated with insulin in response to these falsely elevated glucose results. The Roche (Roche Diagnostics, Indianapolis, IN) ACCU-CHEK Inform I (Inform-I) blood glucose meter uses GDH-PQQ methodology. A mutant quinone GDH is used in ACCU-CHEK Inform II (Inform-II) which can distinguish glucose from maltose. In this study, we want to determine if maltose interference has been eliminated with Inform-II using samples containing maltose and samples from patients treated with icodextrin peritoneal dialysis.

Methods: Samples containing 240 mg/dL, 360 mg/dL, and 720 mg/dL of maltose were prepared by spiking a whole blood sample with maltose. At each level of maltose, a control sample was prepared by adding equal amount of water to an aliquot of the blood sample. Glucose results in these samples were measured in triplicates with both Inform-I and Inform-II. Previously frozen plasma samples from three patients who underwent icodextrin peritoneal dialysis were also tested with Inform-I, Inform-II, and results compared with that obtained with Beckman Olympus AU5400 (AU5400) which is free from maltose interference.

Results: Glucose results in samples containing different amounts of maltose and samples from the three patients obtained with Inform-I, Inform-2, and AU5400 are shown in the table below:

Sample Containing Maltose	Glucose with AU5400 (mg/dL)	Glucose with Inform-I (mg/dL)	Glucose with Inform-II (mg/dL)	Falsely Increased Glucose with Inform-I (mg/dL)	Falsely Increased Glucose with Inform-II (mg/dL)
240 (mg/dL)		241	114	151	10
360 (mg/dL)		313	121	225	16
720 (mg/dL)		563	128	491	34
Patient 1	217	327	238	110	21
Patient 2	196	245	218	49	22
Patient 3	276	286	289	10	13

Conclusion: Both the Inform-I and Inform-II exhibited maltose interference which increases with maltose concentration. However, significant reduction of maltose interference was observed with Inform-II. The increases in the glucose results obtained with Inform-II in samples of patients who underwent icodextrin peritoneal dialysis were minimal, therefore, may not change the clinical decisions to manage blood glucose levels in these patients.