

GlucoMen Day Continuous Glucose Monitoring System: A Screening for Enzymatic and Electrochemical Interferents

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Abstract

Background:

While most of the common drugs with the potential to interfere with continuous glucose monitoring (CGM) systems are accessible over the counter and can be assumed by CGM patients without medical supervision, many other chemicals are frequently used to treat critically ill patients. Continuous glucose monitoring reading accuracy may also be compromised in patients characterized by abnormally high concentrations of physiological interferents. In this article, 22 species selected from endogenous and exogenous chemicals were screened as possible interferents of GlucoMen[®]Day (GMD), the new microdialysis-based CGM system from A. Menarini Diagnostics.

Method:

Interference testing was performed according to the EP7-A2 guideline (Clinical and Laboratory Standards Institute 2005). Interference was evaluated at two levels of glucose, with each interferent additionally tested at two concentrations. Furthermore, two configurations of the GMD disposable sensor kit—one designed for subcutaneous application, the other for direct intravascular CGM—were challenged with interferent-spiked serum and blood samples, respectively.

Results:

With the exception of dopamine (however, at very high, nonphysiological concentrations), no interference was observed for all the tested substances. Interestingly, none of the common electrochemical interferents (including ascorbic acid, acetaminophen, and salicylic acid, which represent the major specificity issue for the competing CGM systems) significantly affected the system's output.

Conclusions:

These results provide clear insights into the advantages offered by the use of a microdialysis-based CGM system that additionally relies on the detection of hydrogen peroxide at low operating potential. GlucoMen Day may become the CGM system of choice for those patients who require either regular administration of drugs or their glycemia to be tightly controlled in the intensive care unit or similar environments.

J Diabetes Sci Technol 2012;6(5):1172-1181

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Abbreviations: (CGM) continuous glucose monitoring, (CLSI) Clinical and Laboratory Standards Institute, (GMD) GlucoMen Day, (GOx) glucose oxidase, (ICU) intensive care unit, (SMBG) self-monitoring of blood glucose

Keywords: critical care, GlucoMen Day, glucose, interferents, intravascular continuous glucose monitoring, microdialysis

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