Reviewer's report

Title: Screening for hypoglycemia at the bedside in the neonatal intensive care unit (NICU) with the Abbott PCx glucose meter

Version: 1 Date: 10 May 2006

Reviewer: Gerald J Kost

Reviewer's report:

Thank you for the opportunity to review this informative article that addresses the utility of a glucose meter system for neonatal screening. The paper is exceptional in its presentation of quantitative results that will prove useful to nurses and physicians working in pediatric settings. It also represents a good model of analysis in laboratory medicine.

The results would become more accessible to nurses and clinicians (in the U.S.) if the authors also presented glucose values in conventional units (mg/dL). This convenience can be done easily and explicitly in the abstract, in Figure 1 by adding an extra horizontal axis, and in Figure 3 in parentheses next to the mmol/L values, but need not be included everywhere in the text. Also, the glucose conversion factor (mmol/L to mg/dL) should appear in the methods section.

Readers will take careful note of the hematocrit effect (vividly illustrated in Figure 2) as a confounding variable in neonates of the gestational age range given in Table 1. For clarity and emphasis, the authors should conclude the abstract with the same statement found on page 14 about the influence of hematocrit and low glucose concentration (esp. the sensitivity issue) as contributors to differences in results obtained with the glucose meter versus laboratory method.

Information about calibration and standardization of the glucose meter and laboratory method can be obtained from the manufactures and added to the methods section, as it may explain part or all of the bias observed.

The authors are careful in their use of the word “plasma” and provide explanation of possible mechanisms for the hematocrit effect in terms of plasma filtration. They also point out the vulnerability of young erythrocytes. Thus, they should add whether the glucose meter manufacture claimed accuracy specifically for prematures and neonates, inclusive within the concept of the licensed hematocrit range of 0.20 to 0.70 cited on page 13.

Point-of-care testing is defined as testing at or near the site of patient care. As such, it includes both bedside testing and near-patient testing.

The authors studied a handheld glucose meter system that is used at the bedside, but appear not to have mentioned a competing instrument (manufactured by HemoCue) known for accuracy and used for near-patient testing in the pediatric setting. Discussion of clinical investigations in peer-reviewed literature for this instrument would be informative for the reader and particularly relevant to future planning because the company is in the process of introducing a handheld model that will be licensed for the diagnosis (yes, diagnosis!) of diabetes in the U.S.

Thus, I encourage the authors to investigate this new alternative in the context of receiver operator curve analysis (done so nicely in this paper) to determine its cut-off value for screening specifically in the premature and newborn patient populations.

What next?: Accept after minor essential revisions

Level of interest: An article of outstanding merit and interest in its field

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests: