

PP 07 - Comparison of Measurement of Plasma Glucose Using In-House Glucose Reagent and Commercial Glucose Reagent on a Fully Automated Biochemistry Analyzer

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Background: Estimation of plasma glucose using glucose oxidase/oxidase is one of the most frequently used assays in clinical biochemistry laboratories. Although, commercial reagents are widely used, for large scale analysis, use of in-house reagents can be more cost effective.

Objectives: To compare the performance characteristics of a specific in-house glucose reagent (glucose oxidase/oxidase) with commercial glucose reagent (glucose oxidase/oxidase) on a fully automated biochemistry analyser and also to assess the stability of the specified formula of the in-house glucose reagent.

Methodology: In this study, 200 retained blood samples received for estimation of plasma glucose were analysed using the in-house glucose reagent and the commercial glucose reagent within 6 hours of collection on fully automated biochemistry analyzer. The analyzer was simultaneously loaded with both reagents and calibrated with the same commercial calibrator. Daily two levels of Internal Quality Controls and monthly External Quality Assurance samples were run to assure the precision and accuracy. Stability of the in-house reagent was assessed within a period of three months.

Results and conclusions: Mean values of the in-house glucose reagent and the commercial glucose reagent were 142.28 and 141.44 mg/dL; respectively ($P = 0.001$) and showed a positive correlation of 0.9993. There was no significant difference between the two methods in the range between 0-300 mg/dL ($P > 0.05$). The in-house reagent showed a slightly higher glucose concentration compared to the commercial reagent in patients with glucose levels above 300 mg/dL which was statistically significant ($P = 0.007$). The agreement between two methods was compared using Bland-Altman plot and it showed a positive bias of 0.835 in the range from 0-500 mg/dL. Accuracy, sensitivity and specificity of the in-house reagent were 96.5%, 96.15% and 97.14%; respectively. The reagent was stable for three months period at 2-8 °C. Performance of in-house glucose reagent is well correlated with that of commercial reagent for the range up to 300 mg/dL.

Keywords: Commercial glucose reagent, fully automated analyzer, in-house reagent, plasma glucose measurement