Poster

[P27-7] P27-7: Assay

Chair: Wei-Chi Ku, Taiwan

Wed. Sep 27, 2017 12:30 PM - 1:30 PM Annex Hall (1F)

(Wed. Sep 27, 2017 12:30 PM - 1:30 PM Annex Hall)

[P27-7-4] Clinical significance of N-acetylcysteine interferes with the trinder reaction based assays

Yusheng Zhu (Pennsylvania State University Hershey Medical Center)

Keywords: N-acetylcysteine, Interference, Trinder reaction

Background

N-acetylcysteine (NAC) is a drug used to treat acetaminophen poisoning and other diseases. NAC has been recognized as a source of interference in multiple tests including triglyceride, cholesterol (total, LDL-, HDL-), lactate, uric acid, and lipase that are based on the Trinder reaction. However, the magnitude and clinical impact of NAC interference with these analytes remain inconclusive. This study aims to determine the clinical significance of NAC interference in the Abbott Architect assays.

Methods

Serum containing 5 concentrations of analytes was spiked with 5 therapeutic doses of NAC (50 - 2500 mg/L). Serum without NAC was used as a control. Analytes were measured either immediately after NAC addition or after up to 48 hr storage at 4 ˚C. Samples collected from 6 acetaminophen-overdosed patients before and after NAC infusion were also assayed. The interference was defined as % difference of analytes in NAC-containing samples from the control. A bias greater than allowable total error was considered clinically significant. Additionally, multiple regression analysis was used to predict the true values of analytes in NAC-containing samples.

Results

NAC dose-dependently decreased the results with a maximum of 5-95% reduction among analytes. The magnitude varied with analyte concentrations. Clinically significant interferences were observed for triglycerides, total cholesterol, lactate, uric acid, and lipase with NAC concentrations at 250 - 1250 mg/L, respectively. Statistically significant but clinically insignificant negative bias for LDL- and HDL-cholesterol was also observed. NAC interference was gradually attenuated by prolonged storage. A significant decrease in total cholesterol and uric acid was also observed in post-NAC treatment samples from acetaminophen-overdosed patients. Additionally, the predicted concentrations of analytes in NAC-containing samples using multiple variable regression model showed significant correlation with the measured values ($P<0.05$).

Conclusions

Therapeutic doses of NAC can cause clinically significant negative bias in several assays involving the Trinder reaction on the Abbott Architect platforms. The magnitude of interference depends on the concentrations of NAC and analyte as well as the storage time. Additionally, this study demonstrates the possibility of using multiple variable regression equations to predict the analytes’ true concentrations in NAC-containing specimens.