Evaluation of Troponin T on AQT90 Flex and Cobas 8000 as a rule in/out tool in an emergency ward.

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Background:

Troponin measurement is the gold standard for diagnosis of Acute Myocardial Infarction (AMI). Troponin (highly sensitive (hs), T or I) is measured by immunochemistry instrument or by Point of Care (POCT). POCT can be useful in emergency lab or ward for a faster diagnosis of patients with chest pain. Our study compared analytical performance of a POCT AQT90 Flex (Radiometer Medical - AQT) and TnThs Cobas 8000 (Roche Diagnostics - Cobas). We also compared the clinical performance of both methods at recommended cut-off (14 ng/L for Cobas and 30 ng/L for AQT).

Materials and Methods:

We selected 104 patients (296 samples) (range: 6-13822 ng/L) admitted in the Emergency ward for which at least 1 troponin determination (Cobas 8000) had been requested in the past 24 hours according to rule in/out procedure applied by this ward. Samples were then measured with the AQT. Inter-assay CV was maximum 8.6% and 9.6% for Cobas and AQT respectively. The cut-off defined as the 99th percentile for Roche was 14 ng/L and the recommended decision threshold value was 30 ng/L for Radiometer. Retrospective analysis of final diagnostic was obtained for all participants: we considered as “true positive“ patients for whom a final diagnostic was ST segment-Elevation Myocardial Infarction (STEMI) or non STEMI (NSTEMI).

Figure 1: Regression curve

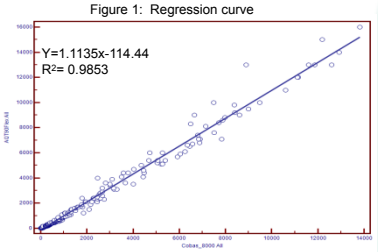


Figure 2: Scatter plot results <54 ng/ml

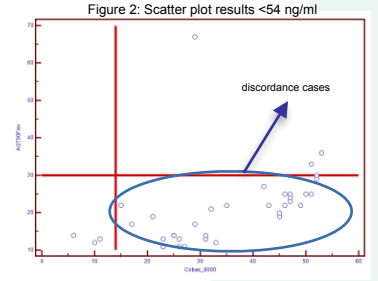


Figure 3: Passing Bablock regression

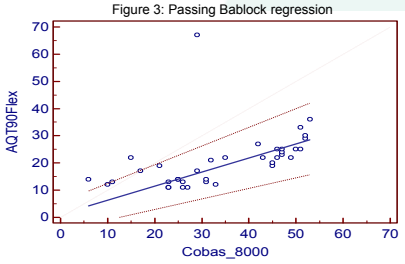
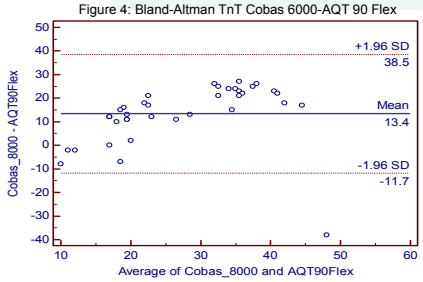


Figure 4: Bland-Altman TnT Cobas 6000-AQT 90 Flex



Results:

On the whole range of measure, the 2 methods showed a good correlation (r^2=0.98) (Fig.1). Regression equation was Cobas = 0.98 AQT + 31 ng/L (95%CI of the intercept: (26.7;37.7) and 95% CI of the slope (0.96;1). When we stratified, for the values <54 ng/L (n=35) (Fig.2-3), the equation became AQT = 0.52 Cobas +1.1 ng/L (95%CI of the intercept: (-4.8;5.5) and 95% CI of the slope (0.39;0.69). Bland and Altman plot showed positive bias (mean found= 13.4 ng/ml with a SD of 12.5 ng/ml)(Fig.4). At admission [2-7 hours], 78 (81%) of admitted patients were finally considered as AMI, sensitivity was 92 % [96%] for Cobas and 78% [91%] for AQT. Specificity was 15% for Cobas (cut-off 14ng/L) or 73% (cutoff 54 ng/L) and 76% for AQT(cutoff 30 ng/ml).

Conclusions:

Overall, there was a good correlation between the 2 methods. However, using a cut-off of 14 ng/L for Cobas is questionable for a rule in/out procedure in an emergency ward. Using 54 ng/L for Roche and 30 ng/L for AQT would have led to the best discrimination between patients presenting AMI or not.