



Point-of-Care Monitoring for Optimal Anti-Platelet Therapy in Acute Clinical Settings



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Introduction:

- Anti-platelet therapy including aspirin (ASA) and clopidogrel is recognized as clinically important in patients at risk of developing thrombotic events
- Recently it has been realized that empiric therapeutic dosing is suboptimal due to inter-patient variability with regard to response, receptor concentration etc.
- Hence there is a clinical need to monitor such therapies on an individual basis
- Traditional platelet tests including light transmission aggregometry (LTA) are inconvenient for acute diagnostic testing. Hence, the introduction of “near- patient” test systems
- Here we describe the utility of a point-of-care (POC) test platform (PlateletWorks®) for monitoring platelet response to ADP and arachidonic acid (AA) as the agonists

Methods & Procedure:

PlateletWorks (Helena Laboratories, Beaumont, TX) evaluates non-anticoagulated whole blood as the sample medium. It utilizes the principle of differential platelet counting in either the absence or presence of a platelet agonist (ADP, collagen, AA etc.) as a direct indication of platelet function. Results may be expressed as either % aggregation or % inhibition.

In human clinical trials subjects (n=205) were evaluated for their response to ADP (20µM) and a second group of subjects (n=40) were evaluated for their response to AA (either 5µM or 1.25mg) on both the Plateletworks and LTA (Chronolog, Haverstown, PA) test platforms.

Results:

The comparative data for each agonist between the two platforms are shown in Figures 1 & 2. The correlation between the two systems for ADP was $r=0.91$. For AA, as LTA provides a qualitative and Plateletworks a quantitative measure of response data were analyzed using McNemar test of symmetry with a calculated Cohen's kappa value of 61.5%.

Figure 1: Linear regression for ADP between two systems

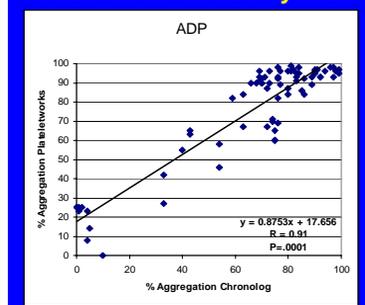
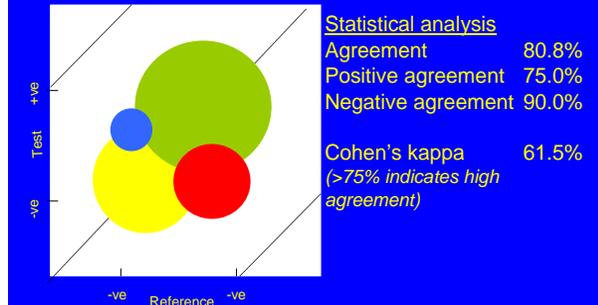


Figure 2: Statistical analysis of laboratory methods



Conclusions:

- This novel POC test for platelet response may be a suitable peri-procedural screening assay to determine the effective dose of administered pharmaceutical on an individual patient basis
- It may also provide clinical decision as to alternative anti-platelet therapies
- Large scale studies both in vascular disease and other disease processes are ongoing

Agonists: ADP - FDA approved (91); AA - currently under FDA review