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ABSTRACT N. PO01

DIAGNOSIS OF INHERITED PLATELET FUNCTION DISORDERS BY PLATELET AGGREGOMETRY USING A FULLY AUTOMATED COAGULATION ANALYZER.

E. Falcinelli [1], A.M. Mezzasoma [1], L. Bury [1], R. Martini [1], I. Tano [1], A. Rechner [2], P. Gresele [1].

1 Department of Medicine, Section of Internal and Cardiovascular Medicine, University of Perugia; [2]Sysmex Europe.

Background and Aims: Inherited platelet-function disorders (IPFD) are qualitative platelet disorders with variable bleeding tendencies due to impaired platelet aggregation. Light-transmission aggregometry (LTA) represents the gold standard for their laboratory diagnosis. LTA is time-consuming, requires large blood-volumes and specialized personnel. In recent years, attempts have been made toward automation to overcome some limitations of manual LTA. Sysmex CN-6500 is a new haemostasis analyser that performs platelet aggregation with small volume samples (140µl instead of 250µl necessary for manual LTA or 300µl for Multiplate) and automates reagent dilution.

Aim of our study was to test the agreement between automated Sysmex CN-6500, manual LTA and multiple electrode aggregometry (MEA) in the study of IPFD.

Methods: IPFD patients were studied for platelet aggregation comparing 3 different methods: LTA with APACT 4 aggregometer (Helena), whole blood impedance aggregometry with Multiplate (Roche) and the automated LTA with Sysmex CN-6500 analyser using ADP, arachidonic acid, collagen and epinephrine as agonists.

Results: 50 patients affected by different forms of IPFD (Glanzmann thrombasthenia, PT-VWD, Filamin A defect, TAR, FPD/AML, TxA_2 receptor defect, HPS, delta-SPD, COX-1 like defect) were tested. The platelet count in PRP ranged from 176 to 369 × 109/L, with three samples between 100 and 150 × 109/L. No significant differences in maximal aggregation amplitude were found between conventional LTA and the Sysmex CN-6500 using all agonists. Only ADP 10µM performed with LTA gave slightly, but significantly, lower values compared to Sysmex CN-6500 (48.2±5.9% vs 61±4.6%, $p<0.05$). Passing-Bablok regression analysis showed good agreement between Sysmex CN-6500, LTA and MEA, with significant correlations with all agonists, the highest with AA for MEA (Pearson $r=0.67$, $p<0.0001$) and with ADP for LTA (Person $r=0.84$, $p<0.0001$) (Figure 1A, B). Moreover, the percentage of patients with abnormal platelet aggregation in response to the different agonists did not differ significantly when comparing aggregation performed with Sysmex CN-6500 and with APACT 4 aggregometer or with Multiplate (Figure 1C, D).

Conclusion: Automated platelet aggregometry with Sysmex CN-6500 provides comparable results to two widely used and validated platelet aggregation assays, allowing the reliable measurement of platelet aggregation and the correct identification of patients with IPFD, with the advantage of full automation, smaller sample volume and shorter turnaround time.

Email: *emanuelafalcinelli@gmail.com*

Correlation between percentage of ADP 5mM-induced maximal aggregation (%) obtained with CN-6500 vs APACT4 (A) and between AA 1mM-induced aggregation (AUC) obtained with CN-6500 vs Multiplate (B). Aggregation amplitude in IPFD patients performed by CN-6500 and APACT4 (C) or by CN-6500 and Multiplate (D). The percentage refers to the percentage of patients with abnormal platelet aggregation in response to the selected agonist. Horizontal dotted lines: healthy controls cut-off.