NEW QUANTITATIVE aPTT WAVEFORM ANALYSIS ON BEHRING COAGULATION SYSTEM

Milos Marija[1], Zupancic-Salek Silva[2], Coen Herak Désirée[1], Zadro Renata[1]
[1]Department of Laboratory Diagnostics, University Hospital Centre Zagreb, Zagreb, Croatia [2]Division of Hematology, Department of Medicine, University Hospital Centre Zagreb, Zagreb, Croatia

INTRODUCTION

Traditional coagulation tests, such as PT and aPTT, do not assess the whole coagulation process. These tests use clot formation as their endpoint, which occurs when only around 5% of all physiologically relevant thrombin is formed. At the same time, the most advanced automated photo-optical coagulometers continue to measure the entire process of fibrin clot formation over time and collect optical data in the form of a reaction curve.

AIM

To examine the performance of new developed waveform analysis by comparing the results with those obtained by standard laboratory tests.

METHODS

♪ New quantitative aPTT waveform analysis:
SINGLE aPTT MEASUREMENT - TWO DIFFERENT EVALUATION MODES

drifting baseline	aPTT-DB
point of inflexion	aPTT-PI

⇩ Quantitative parameters was calculated

DELTA = aPTT-PI - aPTT-DB
RATIO-1 = aPTT-PI/aPTT-DB
RATIO-2 = DELTA/aPTT-DB

♪ aPTT measurement
Actin FS, BCS - Siemens Medical Solutions, Marburg, Germany
♪ One-stage clotting FVIII activity - FVIIIclot
Chromogenic FVIII activity - FVIIIch
Siemens Medical Solutions, Marburg, Germany

PATIENTS

♪ 101 HEALTHY MALE SUBJECTS
♪ 100 HEMOPHILIA A PATIENTS
♪ 56 severe
♪ 44 non-severe

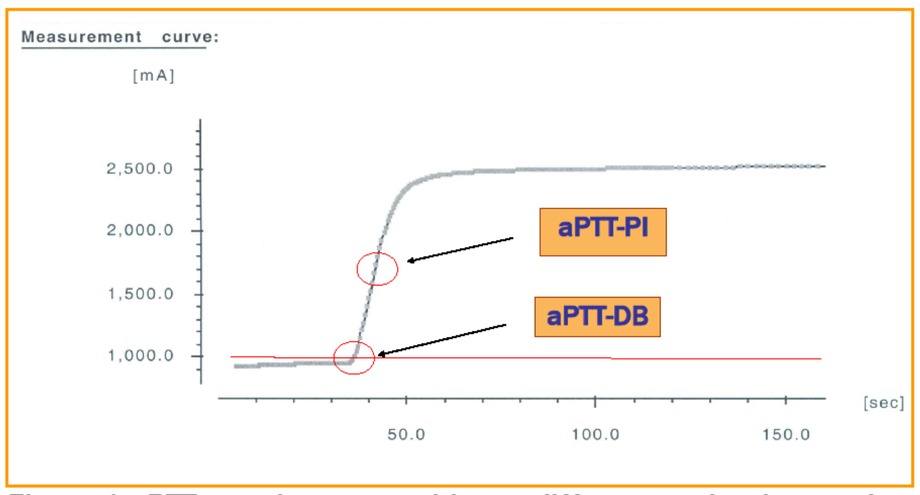

Figure 1 aPTT reaction curve with two different evaluation modes.

RESULTS

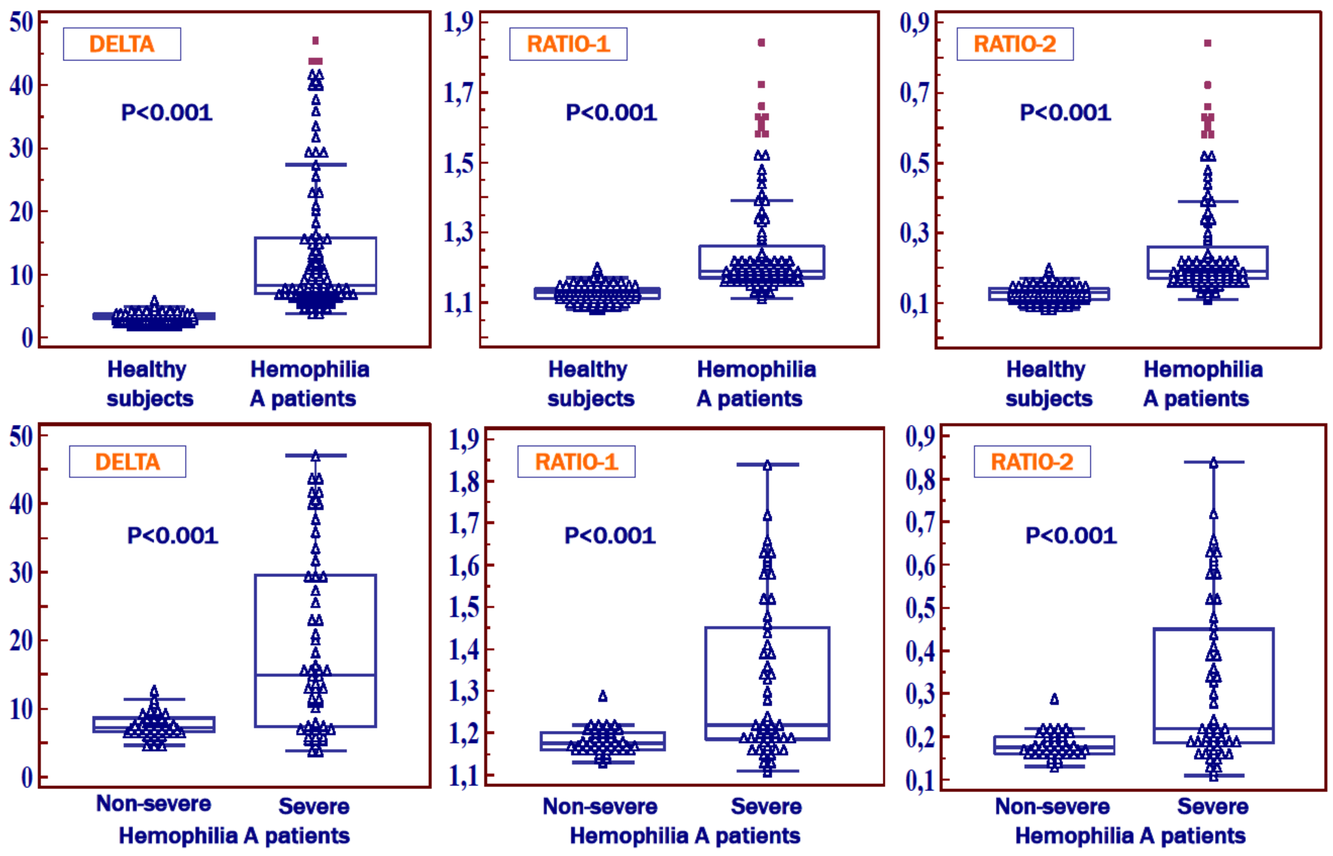

Figure 2 Box-and-whisker plots of DELTA, RATIO-1 and RATIO-2 in healthy subjects and hemophilia A patients.

Table 1 Correlation of DELTA, RATIO-1 and RATIO-2 with FVIIIclot and FVIIIch in all groups of samples.

		N	DELTA r (P)	RATIO-1 r (P)	RATIO-2 r (P)
All samples	FVIIIclot	201	-0.882 (<0.001)	-0.795 (<0.001)	-0.795 (<0.001)
	FVIIIch		-0.872 (<0.001)	-0.793 (<0.001)	-0.793 (<0.001)
Hemophilia A patients	FVIIIclot	100	-0.852 (<0.001)	-0.682 (<0.001)	-0.682 (<0.001)
	FVIIIch		-0.871 (<0.001)	-0.712 (<0.001)	-0.712 (<0.001)
Severe hemophilia A patients	FVIIIclot	56	-0.827 (<0.001)	-0.671 (<0.001)	-0.674 (<0.001)
	FVIIIch		-0.819 (<0.001)	-0.683 (<0.001)	-0.684 (<0.001)
Non-severe hemophilia A patients	FVIIIclot	44	-0.676 (<0.001)	-0.342 (0.023)	-0.341 (0.024)
	FVIIIch		-0.725 (<0.001)	-0.395 (0.008)	-0.408 (0.006)
Healthy subjects	FVIIIclot	101	-0.227 (0.023)	-0.111 (0.269)	-0.111 (0.269)
	FVIIIch		-0.152 (0.128)	-0.152 (0.128)	-0.072 (0.477)

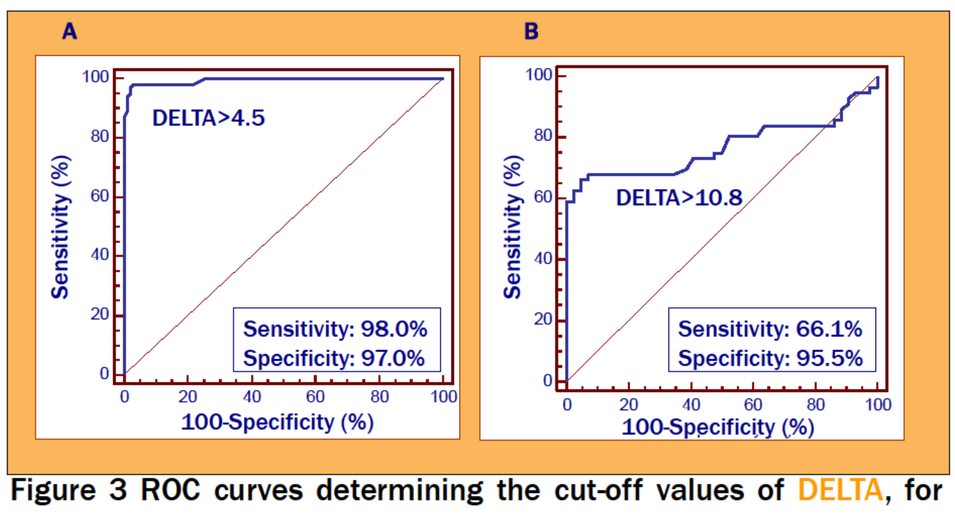

Figure 3 ROC curves determining the cut-off values of DELTA, for distinguishing between healthy subjects and hemophilia A patients (A) and between severe and non-severe patients (B).

CONCLUSION

The newly developed quantitative aPTT waveform analysis derived from the routine aPTT assay serves as an excellent laboratory tool for assessing coagulation process, as well as for obtaining additional information about hemophilia A patients.

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