

UTILITY OF NEW QUANTITATIVE aPTT WAVEFORM ANALYSIS IN LABORATORY MANAGEMENT OF HEMOPHILIA A PATIENTS

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INTRODUCTION

Diagnosis of hemophilia A is usually made by the direct measurement of FVIII, using either the clotting (FVIIIclot) or chromogenic assay (FVIIIch). The obtained activity allows categorization of the disease severity, but it has a relatively poor correlation with clinical phenotype. In contrast, waveform analysis as a global coagulation assay seems to display a relatively good correlation with the bleeding tendency.

AIM

To compare a newly developed quantitative aPTT waveform analysis with standard laboratory assays (FVIIIclot and FVIIIch) in hemophilia A patients and correlate these results with known clinical parameters (age at first joint bleed, number of joints with hemophilic arthropathy number of annual joint bleeds and annual FVIII consumption).

PATIENTS



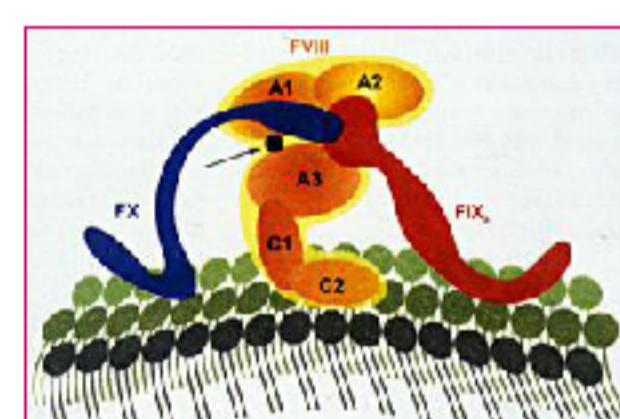
37 SEVERE HEMOPHILIA A PATIENTS
44 NON-SEVERE HEMOPHILIA A PATIENTS

METHODS



QUANTITATIVE aPTT WAVEFORM ANALYSIS by using TWO DIFFERENT EVALUATION MODES. 3 QUANTITATIVE PARAMETERS:

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



One-stage clotting FVIII activity - **FVIIIclot**
Chromogenic FVIII activity - **FVIIIch**

(Actin FS, BCS - Siemens Medical Solutions, Marburg, Germany)

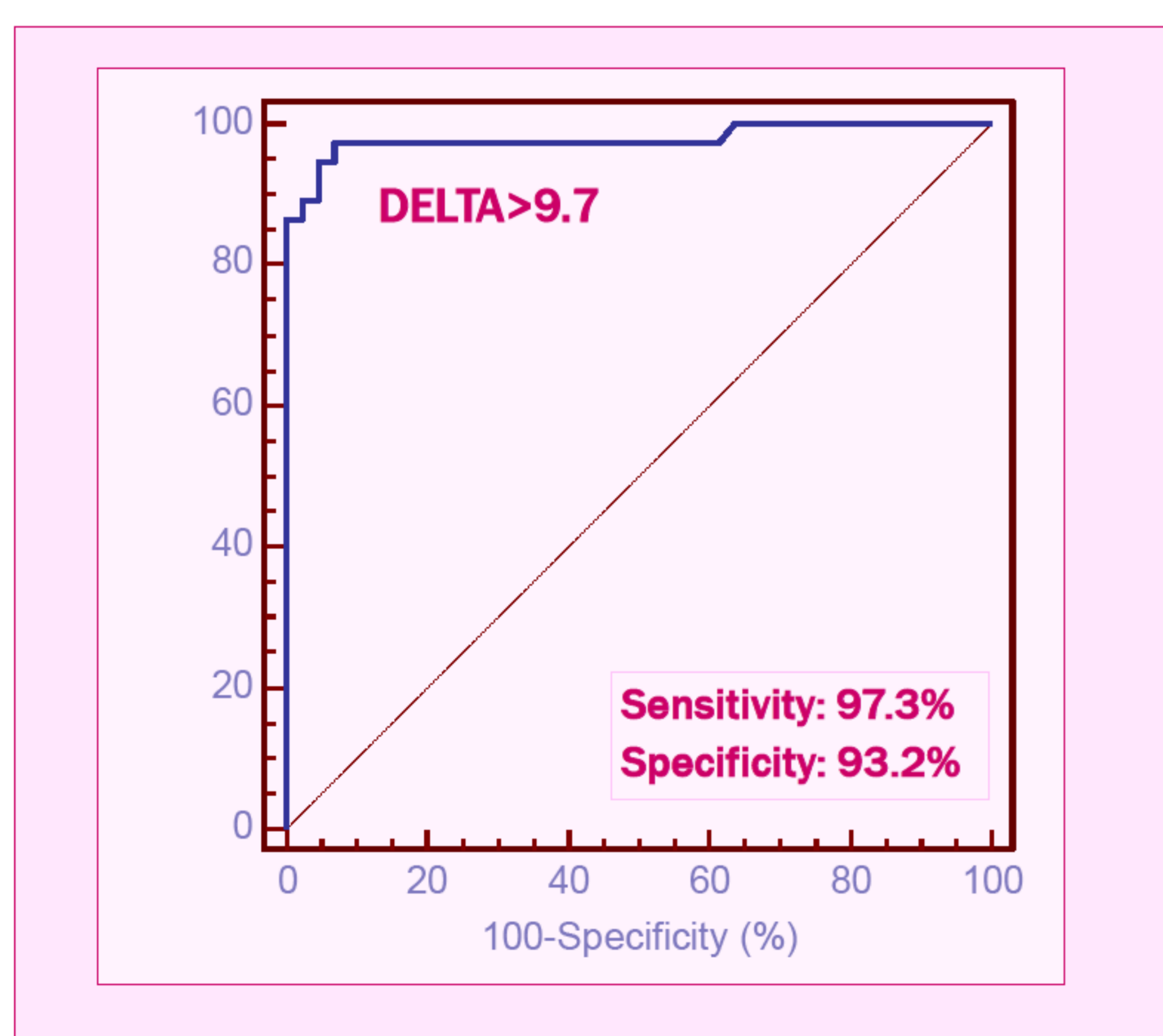


Figure 1 ROC curve determining the cut-off value of DELTA, for distinguishing between severe and non-severe hemophilia A patients.

CONCLUSIONS

The results obtained by new quantitative aPTT waveform analysis for parameter DELTA were equivalent to those obtained by standard laboratory methods.

The simplicity of new analysis, as well as the cost benefit of measuring routine aPTT, make this approach a reasonable and promising tool for assessing coagulation in hemophilia patients.

RESULTS

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

		N	DELTA r (P)	RATIO-1 r (P)	RATIO-2 r (P)
Hemophilia A patients	FVIIIclot	81	-0.850 (<0.001)	-0.685 (<0.001)	-0.685 (<0.001)
	FVIIIch		-0.858 (<0.001)	-0.697 (<0.001)	-0.697 (<0.001)
Severe hemophilia A patients	FVIIIclot	37	-0.330 (0.048)	-0.218 (0.191)	-0.218 (0.191)
	FVIIIch		-0.361 (0.030)	-0.225 (0.178)	-0.225 (0.178)
Non-severe hemophilia A patients	FVIIIclot	44	-0.535 (<0.001)	-0.284 (0.062)	-0.284 (0.062)
	FVIIIch		-0.472 (<0.001)	-0.265 (0.083)	-0.265 (0.083)

Table 2 Correlation of FVIIIclot, FVIIIch, DELTA, RATIO-1 and RATIO-2 with clinical parameters.

	Age at first joint bleed r (P)	Number of joints with hemophilic arthropathy r (P)	Number of annual joint bleeds r (P)	Annual FVIII consumption r (P)
FVIIIclot	0.568 (<0.001)	-0.581 (<0.001)	-0.604 (<0.001)	0.687 (<0.001)
FVIIIch	0.521 (<0.001)	-0.597 (<0.001)	-0.568 (<0.001)	0.617 (<0.001)
DELTA	-0.467 (<0.001)	0.689 (<0.001)	0.585 (<0.001)	0.667 (<0.001)
RATIO-1	-0.349 (0.002)	0.595 (<0.001)	0.456 (<0.001)	0.550 (<0.001)
RATIO-2	-0.351 (0.002)	0.597 (<0.001)	0.458 (<0.001)	0.553 (<0.001)

Table 3 Clinical parameters in hemophilia A patients divided in two groups according to ROC analysis of parameter DELTA.

	Age at first joint bleed (year)	Number of joints with hemophilic arthropathy	Number of annual joint bleeds	Annual FVIII consumption (IUkg ⁻¹)
Group I DELTA > 9.7	1 (0.1-15)	4 (0-10)	18 (0-180)	2571 (0-5143)
Group II DELTA ≤ 9.7	4 (0.1-73)	1 (0-10)	0 (0-180)	75 (0-5829)
P	<0.001	<0.001	<0.001	0.001

