Letter to the Editor

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Reagent Dependency of Derived Fibrinogen Method

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bin time test and this might raise some new requirements against the thromboplastin.

The reagent dependency of the derived fibrinogen method was investigated on ELECTRA 900C (Medical Laboratory Automation, Pleasantville, N.Y.). This coagu-lometer printed out not only the fibrinogen value of the sample, but the delta optical density (DOD) value, too. Simplastin Excel and Simplastin Excel S, two rabbit brain thromboplastins of Organon Teknika (Durham, N.C.) along with Innovin, a dried, recombi-nant human reagent from Baxter

Recently, a new method of serial fibrinogen determination was developed using a well-known procedure applied to widely available photo-optical coagulometers [1]. The derived fibrinogen method is based on the determination of the differences in optical density caused by the conversion of fibrinogen to fibrin. This method offers some advantages: it measures only clottable fibrinogen, it is not sensitive to fibrinogen/fibrin degradation products, and proved to be highly reproducible as well [2, 3]. The derived fibrinogen method is performed together with prothrom-

Table 1. Correlation of DOD: Innovin and Simplastin Excel versus Simplastin Excel S (n = 80)

Innovin

Simplastin Excel

Slope Intercept

r

$S_{\chi/\gamma}$

1.387(0.0385) 0.0043 (0.0078) 0.9713 0.0242

2.263 (0.0604) -0.0202(0.0122) 0.9733 0.0380

Values in parentheses represent standard error. In all cases the p values were < 0.0001. r =

Regression coefficient; $S_{\chi/\gamma}$ = standard error of y estimate.

Healthcare (Miami, Fla.), were investigated. The international sensitivity index values for photo-optical coagulometers were 1.96, 1.13 and 0.98, respectively.

According to the laboratory standard procedures, blood samples of 20 healthy persons and 60 unselected patients were collected and stored at -40°C until assay. All plasma samples were obtained in accordance with the Medical Ethical Committee regulations of our institute. For each reagent a reproducibility study was performed using a normal and two abnormal control plasmas for monitoring coagulation. The intra-assay variation of prothrombin time with the thromboplastins did not exceed 2%. The quality control was assessed each working day, the inter-assay variation was less than 3%.

The investigation of DOD correlation with different reagents, Innovin and Simplastin Excel versus Simplastin Excel S, gave linear regression lines (table 1). The intercepts were very close

to zero. The regression coefficients were 0.9713 and 0.9733, and the p values were smaller than 0.0001, which means an excellent correlation between DOD determined by different re-

agents. The slope of fitted lines was much larger than one, indicating that Innovin and Simplastin Excel gave a significantly larger DOD sign with the same amount of fibrinogen than Simplastin Excel S. Similar, but smaller differences had been mentioned in the literature [4]. However the correlation of DOD and the cause of differences was not investigated.

The slopes of DOD correlation determined by different thrombo-plastins revealed a remarkable reagent dependency of the derived fibrinogen method. It seems to be rather difficult to explain these differences. Derived fibrinogen estimation is an endpoint method, which is based upon the differences of optical density measured at the start and at the endpoint. The reaction time is fixed at 106 s on the used coagulometer. The explanation might be that in spite of this relatively long time from the start to the endpoint, the fibrinogen-fibrin conversion might not be completed. May be part of the fibrinogen molecules did not convert, because they were precipitated together with the fibrin clot. This phenomenon might cause the lower DOD.

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References

- Rossi E, Mondonico P, Lombardi A, Preda L: Method for the determination of functional (clottable) fibrinogen by the new family of ACL coagulometers. *Thromb Res* 1988;52: 453-455.
- Palareti G, Maccaferri M, Manotti C, Tripodi A, Chantarangkul V, Rodeghiero F, Ruggeri M, Mannucci PM: Fibrinogen assays: A collaborative study of six different methods. *Clin Chem* 1991;37:714-719.
- Halbmayer WM, Haushofer A, Schön R, Radek J, Fischer M: Comparison of a new automated kinetically determined fibrinogen assay with 3 most used fibrinogen assays (functional, derived and nephelometric) in Austrian laboratories in several clinical populations and healthy controls. *Haemostasis* 1995; 25:114-123.
- Callahan JB, Hoffman J, Magerko DJ, Houdijk WPM: SQF: Semi-quantitative fibrinogen determination from the PT clotting reaction; in Liu CY, Chien S (eds): *Recent Advances in Haemostasis and Cardiovascular Research*. Taipei, Academia Sinica, 1990, pp 121-127.