Parameters impacting fibrinolysis in patients with liver cirrhosis

Hemostasis, transfusion medicine, vascular, laboratory medicine

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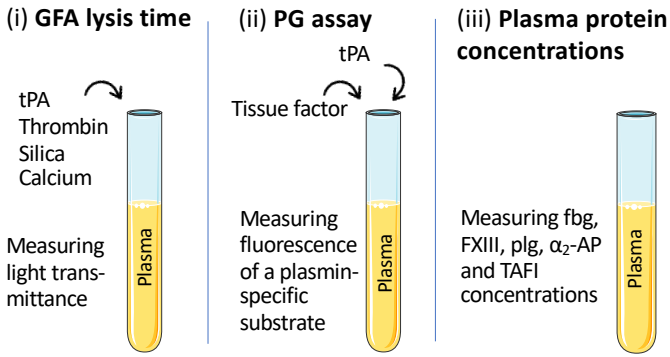
Introduction

Liver cirrhosis (LC) has a prevalence >1%, with an increase of over 80% in the last 30 years. LC is responsible for ca. 2% of deaths worldwide, notably due to thrombo-haemorrhagic complications. The mechanisms that regulate fibrinolysis may be interesting drug targets.

The aim of this study was to investigate fibrinolysis in plasma from patients with LC using (i) a global fibrinolytic assay (GFA) (Hyphen, France), (ii) a calibrated plasmin generation (PG) assay (Thrombinoscope, Netherlands), (iii) measurement of liver-produced proteins related to fibrinolysis, fibrinogen (fbg), factor XIII (FXIII), plasminogen (plg), α_2-antiplasmin (α_2-AP) and thrombin-activatable fibrinolytic inhibitor (TAFI), and to correlate the results with clinical events.

Methods

Plasma collected from 150 patients with Child-A, -B and -C LC. The 3 assays:



Results

Figure 1. GFA (global fibrinolytic assay) lysis time and PG (plasmin generation) according to LC (liver cirrhosis) clinical severity

GFA lysis time (Fig. 1A) and PG (Fig. 1B, 1C, 1D) (red line represents median) were all significantly reduced as a function of increasing LC clinical severity ($p<0.01$). Plasma concentrations of liver-produced proteins involved in fibrinolysis followed the same pattern (not shown here).

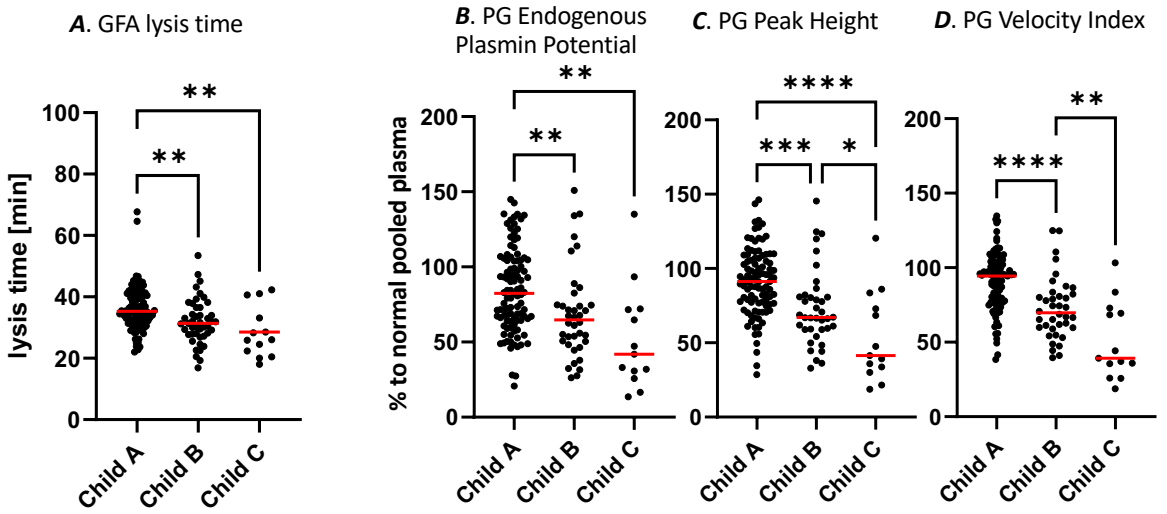
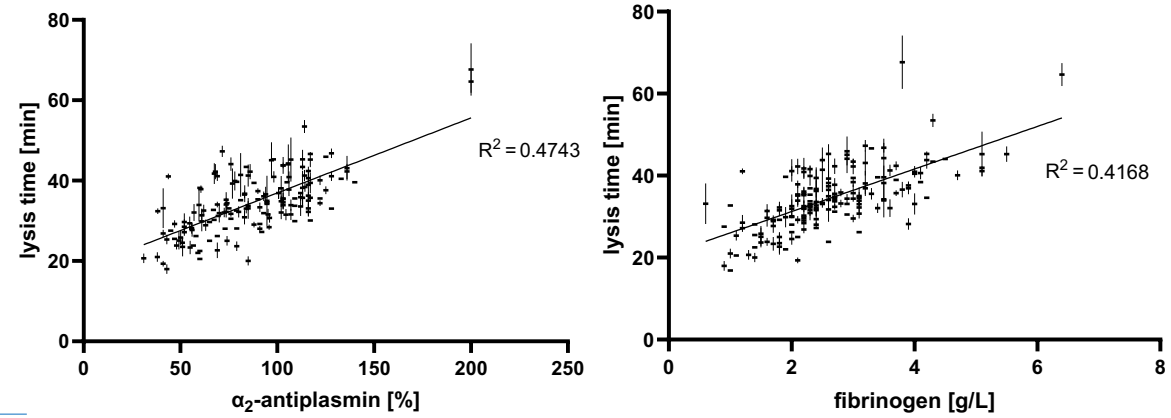


Figure 2. GFA (global fibrinolytic assay) lysis time according to α_2-AP (α_2-antiplasmin) and fbg (fibrinogen) concentrations

GFA lysis time was strongly directly correlated ($p<0.0001$) with α_2-AP ($R^2=0.47$) and fbg ($R^2=0.41$) levels, more than any other measured parameter.



Conclusion

The concentrations of α_2-AP and fbg, the stage of LC, and the presence of portal hypertension (PHT) (not shown) seem to be crucial for the lysis time assessed by the GFA *Lysis Timer* in patients with LC, while PG is strongly affected by the clinical stage of LC. However, in a further one-year clinical follow-up, the GFA lysis time and the main PG parameters were not able to predict the occurrence of thrombo-haemorrhagic events. The development of other plasma lysis models focusing on either clot resistance or plasma lytic capacity is necessary to test their correlation with thrombo-haemorrhagic events in patients with LC.

Conflict of interest : Synapse Research Institute is part of the Diagnostica Stago Group