
A 24 year old man with a history of multiple recurrent venous thrombosis was found to have a qualitatively abnormal fibrinogen. Plasma fibrinogen concentration by a kinetic thrombin time method was 115mg% as compared to 150mg% by the gravimetric method of Katonoff and Menzie. The thrombin, reptilase and Russell viper venom times were all approximately 50% longer than the normal values. Whether the thrombin time or reptilase time was corrected upon addition of CaCl₂, Antigenic quantitation by Laurell Immunelectrophoresis gave a value of 300mg%. On Ouetherlony Immunodiffusion plate, the patient's plasma and normal plasma showed a line of identity. The patient's fibrinogen had a normal rate of migration by one-dimensional immunelectrophoresis but it exhibited an abnormal pattern upon crossed immunelectrophoresis. The abnormality is characterized by the presence of a shoulder on the anodal side of the fibrinogen peak. Family studies revealed that the fibrinogen defect was inherited as an autosomal dominant trait. To determine whether recurrent venous thrombosis is related to increased viscosity due to the abnormal fibrinogen, fibrinogen was purified by the method of BlombSck and the relative viscosity of fibrinogen solution was determined. Preliminary data were suggestive of an increased viscosity of the patient's fibrinogen. These findings indicate that the immunologic-physiologically abnormal fibrinogen may be responsible for recurrent venous thrombosis because of alteration of the physico-chemical properties of the fibrinogen molecule.


A subclinical intravascular coagulation-fibrinolysis syndrome (I.C.F.), is commonly present in cancer patients: a shortened fibrinogen half-life, in fact, have been found in most patients with malignancies, not considering, however, the type and extent of disease. 28 breast cancer patients, without bleeding and thromboembolic disturbances in thrombotic disorders, have been assessed for the presence of I.C.F. syndrome by mean of radiolabeled fibrinogen half-life, fibrinogen level, ethanol gelation test, fibrinogen/fibrin degradation products (FDP). 16 patients without metastases were studied before surgery, while 12 patients with metastases were studied after more than one month from the operation (7 diffuse metastases, 5 pulmonary metastases). 14 out of 16 patients of the first group, and 6 out of 7 with diffuse metastases showed a markedly shortened fibrinogen half-life (hours) (x=53.9±18.2, x=54.2±16.4 as mean±SD respectively), while all the patients with pulmonary metastases showed a normal fibrinogen half-life (x=84±9.9). Normal range was 73-91 h. FDP were almost always normal. In conclusion the tumor per se determine a fibrinogen consumption without a compensatory fibrinolysis. Pulmonary metastases don't promote fibrinogen consumption and/or they don't need fibrin for their growth and spread.


Fibrinogen Genova was recognized in an Italian family. The propositus had no bleeding tendency and diagnosis was performed on the basis of prolonged prothrombin, thrombin and reptilase times of plasma, associated with normal fibrinogen levels. The purified fibrinogen showed an inhibitory effect on the clotting times of the normal one. Functional studies performed on purified fibrinogen revealed that the cleftability was reduced (74%, normal 86-94%) and the thrombin polymerization curve was abnormal due to a delayed fibrin monomers aggregation. The fibrinopeptides release was normal. Analysis of plasmic derivatives carried out by both SDS gel electrophoresis (5 and 9%) and immunological methods showed some differences compared with normal fibrinogen.

The fibrinogen chains were studied on isoelectric focusing slabs and SDS gel electrophoresis. Preliminary results did not reveal any difference with normal.


These results suggest that the measurement of both FPA and β-TG levels in the patients with decompensated DIC, lung cancer, gastric cancer, leukemia, thrombosis, and ARDS. In addition, influences of heparin and urokinase on plasma FPA and β-TG levels were investigated. Plasma FPA and β-TG levels were elevated in decompen­sated DIC (mean FPA: 14.0 ng/ml, mean β-TG: 73.9 ng/ml), but in some cases, these two indicators didn't change in the same manner. This difference was thought to be due to the concentration of plasma fibrinogen and a number of platelets. In the patients with lung cancer, elevated FPA and β-TG levels were found, and the former was elevated with progress of clinical stage. In some patients with leukemia, reduced β-TG levels due to hypoproduction of platelet were found in contrast to elevated FPA levels. On the other hand, in the patients with gastric cancer complicated with DIC, FPA levels elevated very slightly possibly due to extremely low concentration of fibrinogen, and β-TG levels showed a significant elevation.

These results suggest that the measurement of both FPA and β-TG lead us to precise and accurate comprehension of coagulation abnormality. In the patients with overcompensated DIC, elevated FPA and β-TG levels (mean FPA: 117, mean β-TG: 98.0 ng/ml) were found, indicating hypercoagulability. Additionally, we tried to use the ultrafiltration apparatus instead of dialysis tubing to shorten a time required for FPA assay, because dialysis tubing for plasma dialysis requires a lot of time, and is inappropriate for clinical investigation, especially in an emergency.