MEASUREMENT OF FIBRINOGEN CONCENTRATION – RAPID ASSAYS NEEDED FOR THE EMERGENCY ROOM AND ICU

There is a large demand for methods for rapid measurement of fibrinogen for diagnosis of fibrinogen deficiency and monitoring of treatment with fibrinogen concentrate. In most cases fibrinogen deficiency is the consequence of blood loss, intravascular and extravascular consumption, or impaired synthesis. Inherited α- or hypofibrinogenaemia are less common. The consequence of the detection of fibrinogen deficiency is treatment with plasma components, especially fibrinogen concentrate.

In clinical routine, fibrinogen levels are usually determined using clotting assays with or without sample predilution, or PT-derived fibrinogen. It has been noticed that functional defects of fibrinogen frequently escape diagnosis if only PT-derived fibrinogen determination is used, because impaired fibrin polymerization ultimately leads to clots with normal or even increased optical density. Clotting assays without sample dilution display a greater effect of anticoagulants or agents impairing fibrin polymerization (such as fibrinogen degradation products) present in the samples than assays with sample predilution.

Laboratory based routine methods for measurement of plasma fibrinogen concentration require transportation of the blood sample to the laboratory and sample preparation involving centrifugation and transfer to a dedicated assay system, as well as communication of the results to the treating physicians. Therefore, emergency room and intensive care physicians often prefer point of care or near-patient methods using whole blood as sample material, such as thrombelastography.

The presentation will summarize the currently available and new assay technology for measurement of plasma fibrinogen, including point of care- and whole blood assays, influence of anticoagulant drugs, precision, measuring range, time-to-result, and possible therapeutic consequences.

Carl-Erik Dempfle, Marc Michael Müller, Bernhard Thiele
IMD Coagulation Center, Belchenstrasse 1-5, D-68163 Mannheim, Germany