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DQCM beating the standard coagulometer in the domain of sensitivity range and information for hemostasis of human plasma

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Robust and information oriented sensors are pre-requisite for challenges of today's and future biosensing in clinical analysis. In this regard DQCM (Quartz Crystal Microbalances with Dissipation) offers unique properties of sensing mass as well as viscoelastic effects together in single set of measurements. DQCM is attractive due to sensor response in the form of dissipation information addition to frequency shifts. These sensor characteristics are further affected by the viscoelastic properties of the attached thin film on the DQCM transducer. These information add more lights on the hemostasis characteristics rather than that of end point measurements of coagulation status with classical mechanical standard coagulometer. We employed a sophisticated DQCM instrument namely qCell T marketed by 3T analytik GmbH & Co.KG, Tuttlingen, Germany. Following up to our previous primary significance studies on thromboplastin time PT, we selected aPPT (activated Partial Thromboplastin Time) for current study by employing polymer on QCM transducer in real time coagulation measurements. Our data demonstrates that the DQCM is beyond the scope of the current standard coagulometer. DQCM astonishingly superseded the standard coagulometer coagulation time range of upper limits of coagulation times. While a clear picture revealing the exact correlation with standard mechanical coagulometers was achieved at lower and mid-range of coagulation times. Human plasma with different units of heparin to achieve different coagulation times was induced.

Biography

Munawar Hussain is working as post-doctoral in Biosensor Research Group, Institute of Clinical and Experimental Transfusion Medicine, Tuebingen University, Germany.

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