Perioperative Rotational Thromboelastometry during and after Adult Living Donor Liver Transplant Recipients with Genetic and Acquired Tendency to Hypercoagulability

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Background and aim of work: Hypercoagulability can lead to serious thromboembolic events. The **aim** is to assess perioperative coagulation status in recipients with genetic and acquired tendency to hypercoagulability.

Methods: A prospective observational study with 43 consecutive recipients (South African Cochrane Registry 201405000814129). Two or more of following inclusion criteria were used: low protein C, low protein S, low antithrombin, abnormal Factor V Leiden mutation, increased lupus anticoagulant, increased homocystein IgG/IgM, and increased anti-phospholipid antibodies. Rotational thromboelastometry (ROTEM) (EXTEM, INTEM and FIBTEM assays) and conventional coagulation tests (CCT) were assessed preoperative, during surgery and on postoperative days 1, 3 and 7. ROTEM was used to guide blood transfusion. Heparin was infused postoperatively for 3 days (60-180 U/kg/day) and replaced by low molecular weight heparin (20 mg/12 h)

Results: Postoperative FIBTEM (MCF) gradually increased above reference range (Day 7) despite normal fibrinogen plasma levels (P<0.05). EXTEM and INTEM significantly changed with transplant phases (P<0.05), but with no hypercoagulability observed. No significant correlation was found between ROTEM and CCT. INTEM CT (reference range, 100-240 sec) normalize on days 3 and 7 (199.5±73.5 and 186.9±67.01, respectively), despite prolonged aPTT (62.5±17.9 and 48.4±15.7, respectively; reference range 35-45 sec). Partial thrombosis of Hepatic artery and portal vein were reported in 5/43(11.62%) and 2/43 (4.65%), respectively, with high FIBTEM (MCF) in 5 /7. Intraoperative Mean±SD units consumed (transfused patients/overall patients) of red blood cells 8.80±5.82(35/43), fresh frozen plasma 8.62±4.07 (27/43) and cryoprecipitate 12±4 (12/43). No postoperative transfusion was required. Transplant indications were hepatitis C (83.7%), combined with carcinoma (37.2%). Increased lupus anticoagulant, decreased antithrombin III and decreased protein C reported in 88.4%, 86.2% and 74.4%, respectively, with Factor V Leiden mutation positive in 25.6%. 3 month and one year survival was 74.5% and 61.3%

Parameter	Preoperative	Before reperfusion	After reperfusion	POD1	POD3	POD7	Repeated measure ANOVA (F)	p value
Hb (mg/dl)	10.89±1.889	8.96±1.242*	9.12±1.158*	8.86±1.002*	8.61±.722*	9.52±1.042*	910.215	0.000**
Platelets (/ cmm)	83162.79 ±54759.61	71511.62 ±26152.822	67186.04 ±21405.66	47162.79 ±16221.576*	39093.02 ±17041.705*	59325.58 ± 33022.878	534.672	0.000**
INR	1.65±.381	1.66±0.488	2.11±543*	2.19±0.630*	1.81± .612	1.46±.415	1105.801	0.000**
PTT (seconds)	50.88±14.735	61.32±20.745*	79.32±20.273*	78.15±21.153*	62.53±17.914*	48.49±15.796	1871.076	0.000**
Fibrinogen (mg/L)	127.08±56.436	106.13±68.813	73.79±31.398*	96.84±45.194	173.38±66.044*	156.70±78.511	581.359	0.000**

Normal values for: Fibrinogen level 200-400mg/dl. Platelets 150 – 450000/ cmm PTT 20 – 40 sec

Conclusion: A significant postoperative step-wise increase in FIBTEM MCF to beyond normal reference range despite normal fibrinogen plasma levels in this study population. FIBTEM as a predictor for thromboembolic events need to be investigated further with a larger number of recipients, particularly after one week when CCTs fails to diagnose the condition.