ROTEM® based transfusion algorithm reduces transfusion and increases fibrinogen administration during orthotopic liver transplantation

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Background

- Orthotopic liver transplantation (OLT) → transfusion
- Rebalanced coagulation in End Stage Liver Disease (ESLD) patients
⇒ Standard coagulation tests not correlated with thrombosis or bleeding
- ROTEM®
 - Assesses clot initiation, formation and stability on whole blood
 - Recommended by european guidelines
 - Data concerning ROTEM® use in OLT are missing

Impact of thromboelastometry use on transfusion during OLT?

Methods

- Prospective randomized controlled study
- 82 adult patients undergoing OLT surgery
- 4 blood samples during OLT : baseline, anhepatic phase, vascular declamping, end
- Transfusion guided (Fig 1)
 - by thromboelastometry (R group)
 - by standard coagulation tests (S group)
- Hemoglobin ≥ 9g/dl in both groups

Figure 1:Transfusion protocols in R and S groups

Results and Discussion: Patients, donors and preoperative characteristics were similar between the two groups.

	Transfused patients			Amount transfused in transfused patients		
	R group (n=40)	S group (n=41)	p	R group	S group	p
Total transfusion	29 (72,5%)	26 (63,4%)	0,381	3 (1-22)	7 (1-25)	0,005
RBC units	25 (62,5%)	25 (61%)	0,888	3 (1-15)	4 (1-14)	0,330
FFP units	6 (15%)	19 (46,3%)	0,002	2,5 (2-6)	4 (2-9)	0,448
Platelets units	10 (25%)	8 (19,5%)	0,553	1 (1-2)	1 (1-6)	0,910
Fibrinogen (g)	29 (72,5%)	12 (29,3%)	< 0,001	3 (1,5-21)	6 (3-12)	0,421
Tranexamic acid	11 (27,5%)	24 (58,5%)	0,005			
Massive transfusion (≥ 8U)	6 (15%)	12 (29,3%)	0,123			

Table 1: Intraoperative transfusion (RBC= Red Blood Cells, FFP= Fresh Frozen Plasma)

These results are in accordance with previous studies(1). Higher fibrinogen administration could be explained by the good sensibility of ROTEM® concerning fibrinogen. Maintenance of fibrinogen concentration during OLT has already been shown to reduce blood transfusion (2).

Conclusions: During OLT, ROTEM® based transfusion algorithm reduces total blood products transfusion and increases fibrinogen administration.

1. Rouillet S, Freyburger G, Cruc M, et al. Liver Transpl. 2015;21:169-79.
2. Leon-Justel A, Noval-Padillo JA, Alvarez-Rios AI, et al. Clin Chim Acta Int J Clin Chem. 2015;446:277-83.