Introduction: Orthotopic liver transplantation (OLT) remains associated with significant blood loss. This is in part due to enhanced fibrinolysis due to tissue plasminogen activator (tPA) accumulation. Tranexamic acid (TA), a synthetic derivate of lysine, inhibits fibrinolysis, and is reported to reduce bleeding in surgical procedures. However, there is a paucity of published data demonstrating its efficacy in OLTs. The objective of this retrospective clinical trial was to determine the effectiveness of TA in reducing the requirement for allogeneic blood transfusion in liver transplantation.

Methods: Following Research Ethics Board approval, data on consecutive patients undergoing liver transplantation from January 1998 to December 2008 were obtained from a prospectively collected database. Exclusions included combined organ transplantation, contraindications to tranexamic acid (TA), aprotinin use, TA dose less than 3g and insufficient data on TA dose. A propensity score derivation model was used to match patients who received tranexamic acid to unique controls. Measured covariates and outcomes in the matched group were compared between treatment groups with paired Wilcoxon signed-rank test for continuous variables and conditional logistic regression for categorical variables.

Results: 1103 patients received OLT in the study period. After exclusions, 186 matched pairs were obtained from these using propensity score analysis. Overall RBC and blood product transfusion rates were high. The TA group (4 units IQR 1.7) had significantly less RBC transfusion (p 0.0269) than the non TA (5 IQR 2.8) group. There were more patients in the TA group (42, 23% vs 23, 12%) who did not require RBC transfusion (p 0.0079). The FFP, platelet, and massive transfusion (RBC ≥ 6 units) rates were not significantly different between the two matched groups.

Discussion: We used propensity score matching to control large inter group differences inherent in observational studies. All variables including background disease, hepatomas and live donor transplantation were taken into account when matching patients. Our study demonstrates that TA can reduce blood transfusion requirements during OLT. Further investigations are required to determine whether this translates into improved patient safety and outcome.