Risk Factors Associated With Atrial Fibrillation After Liver Transplantation: A Single Center Retrospective Study

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Introduction

Post-operative atrial fibrillation (POAF) after non-cardiac surgery has been associated with higher morbidity and mortality[1,2]. The purpose of this study is to find the incidence of atrial fibrillation within 1st 3 months post-transplant and the perioperative risk factors associated with it.

Methods

364 patients who underwent liver transplant between: 01/2016 to 07/2019 were included. A logistic regression model was built to identify risk factors associated with developing POAF. Clinically significant pre-tx factors from Tables 1 were included as covariates to adjust for cofounders. For categorical variables the differences between the groups were assessed with chi-square or Fisher's exact test and for continuous variables with Wilcoxon rank-sum test.

Odds ratios (OR) and 95% confidence intervals (CI) were calculated. C-index was used to calculate the strength of the associations. The cut-off values for statistically significant continuous variables (age and MELD), was using receiver operating characteristic (ROC) analysis and Youden index. Six months survival rates were assessed using Kalan-Meier survival log-rank test.

References

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3. Hu WS., Lin CL. Risk of new-onset atrial fibrillation among heart, kidney and liver transplant recipients: insights from a national cohort study. Intern Emerg Med. 2019 Jan;14(1):71-76. doi: 10.1007/s11739-018-1950-7.

Results

Incidence of POAF was 11% (39/364). Arrhythmia occurred within a median of 4 (3-15) days post-transplant

A descriptive statistic of pre-intra and postoperative outcomes stratified by POAF vs non-POAF is presented in Table 1 (abbreviated poster version)

Logistic regression identified 3 risk factors associated with developing POA (Table 2)

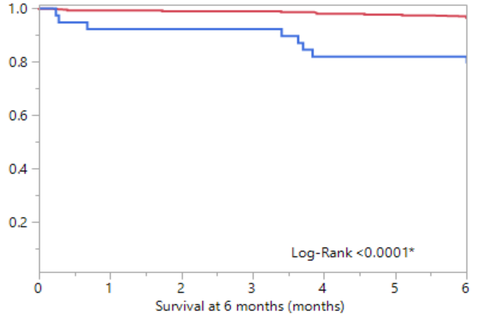
POAF was statistically associated with increase length of hospital and ICU stay, post-transplant renal replacement therapy, cardiac events and consequently

Table 2: Risk factors associated with developing post-transplant atrial fibrillation

	OR	95%CI	P value
Age ≥62 years	2.5	1.231-5.016	0.0110*
MELD score ≥37	2.4	1.018-5.673	0.0453*
Pre-transplant atrial fibrillation	4.7	1.798-12.247	0.0016*

*P value < 0.05: statistical significance

MELD: model for end-stage liver disease



Conclusion

Risk factors found to be associated with onset of POAF might be more commonly present among liver recipients as improvement in surgical technique and medical care of these patients leads to the consideration of older and sicker patients as candidates for transplantation.

The study results on the negative impact of POAF on post-operative outcomes in this population highlights the importance of further understanding POFA and how to better stratify risk in order to reduce incidence and derived complications.

Table 1: Demographic, pre-intra-and postoperative variables

	Atrial Fibrillation		P value
	YES n=39	NO n=335	
Pre-transplant			
Age, years	63 (57-68)	58 (51-64)	0.0020*
Age ≥62 years, n%	20 (53%)	100 (31%)	0.0067*
BMI, kg/m2	25 (23-29)	26 (23-30)	0.2575
ioRRT, n%	16 (41%)	69 (21%)	0.0058*
MELD ≥37, n%	9 (24%)	40 912%)	0.0521
Etiology of liver disease			
NASH, n%	9 (24%)	92 (28%)	0.5473
Viral, n%	12 (32%)	68 (21%)	0.1338
ETOH, n%	9 (24%)	95 (29%)	0.4743
Others, n%	9 (24%)	80 (22%)	0.3143
Pre-Tx CAD, n%	8 (21%)	46 (14%)	0.2911
Diabetes, n%	11 (28%)	120 (37%)	0.2838
HTN, n%	18 (46%)	160 (49%)	0.7164
Smoking, n%	19 (49%)	131 (40%)	0.3133
Pre-Tx A fib, n%	8 (21%)	16 (5%)	0.0002*
Pre-Tx vasopressor use, n%	7 (18%)	24 (7%)	0.0255*
Pre-Tx ICU, n%	12 (31%)	47 (14%)	0.0090*
Intraoperative			
RBC> 10 units, n%	12 (31%)	96 (30%)	0.8737
FFP, units	3 (2-7)	3 (1-7)	0.8151
Platelets, units	1 (1-2)	1 (0-2)	0.0514
Cryo, units	1 (0-1)	0 (1-1)	0.4494
Donor age, years	48 (34-60)	47 (29-59)	0.6023
Postoperative			
Post-Tx LOS, days	20 (15-48)	12 (9-19)	<0.0001*
Days on ventilator, days	3 (1-5)	1 (1-2)	0.0003*
Days in ICU, days	10 (7-38)	5 (4-8)	<0.0001*
Post-Tx RRT <1 month, n%	15 (38%)	46 (14%)	0.0001*
Post-Tx Heart failure <1 month, n%	6 (15%)	17 (5%)	0.0138*
Post-Tx Acute coronary syndrome, n%	2 (5%)	1 (0.3%)	0.0314*

Categorical variables are expressed as percentage (%).
Continuous variables are expressed as median and interquartile ranges (25%-75%).

BMI: body mass index, ioRRT: intra-operative renal replacement therapy, Pre-Tx RRT: pre-transplant renal replacement therapy, MELD: model for end-stage liver disease, NASH: Non-alcoholic steatohepatitis, ETOH: ethanol induced, PVT: portal vein thrombosis, TIPS: trans jugular intrahepatic portosystemic shunt, CAD: coronary artery disease, HTN: hypertension, RVSP: right ventricular systolic pressure, QTc: QT interval corrected for heart rate, ICU: intensive care unit, pRBC: packed red blood cell, FFP: fresh frozen plasma, DCD: donor after cardiac death, LOS: length of stay, RRT: renal replacement therapy.