ATRIAL FIBRILLATION AFTER ORTHOTOPIC LIVER TRANSPLANTATION: INCIDENCE AND RISK FACTORS.

*González Cibrián C; Fernández Martín C; Martín Grande A; Parise Roux D; Prada de las Heras B; Gajate Martín L.
Dept of Anaesthesiology & Intensive Care. Hospital Universitario Ramón y Cajal. Madrid*

BACKGROUND

Survival in patients undergoing Orthotropic Liver Transplantation (OLT) has rise lately, but increase incidence of metabolic and cardiogenic disorders have been observed. Recent studies had demonstrated that major adverse cardiac events, such as atrial fibrillation (AF), have a negative impact in the outcome of patients undergoing liver transplantation

		NOT AF	AF	P
SEX	MALE	299 (77,7%)	15 (71,4%)	0,506
	FEMALE	86 (22,3%)	6 (28,6%)	
LEFT VENTRICULAR DYSFUNCTION		5 (1,3%)	0	0,599
ARTERIAL HYPERTENSION		56 (14,5%)	3 (5,1%)	0,974
MELLITUS DIABETES		70 (18,3%)	7 (33,3%)	0,085
STROKE		4 (1%)	0	0,639
PERIFERAL VASCULAR DISEASE		7 (1,8%)	0	0,533
RENAL REPLACEMENT THERAPY		11 (2,9%)	3 (14,3%)	0,005
HEPATOPULMONARY SYNDROME		6 (1,6%)	1 (4,8%)	0,272
HEPATORENAL SYNDROME		43 (11,2%)	5 (23,8%)	0,081
SMOKER		132 (34,3%)	6 (28,6%)	0,590
TRANSPLANTATION CAUSE	CIRRHOSIS	202 (52,5%)	11 (52,4%)	0,603
	TUMOR	150 (39,0%)	9 (42,9%)	
	FULMINANT	15 (3,9%)	0	
	RETRANSPLANTATION	6 (85,7%)	1 (14,3%)	
CHILD	A	102 (26,5%)	4 (19%)	0,327
	B	119 (30,9%)	4 (19%)	
	C	143 (37,1%)	12 (57,1%)	
	NOT APPLICABLE	21 (5,5%)	1 (4,8%)	
PRETRANSPLANT SITUATION	HOME	313 (81,3%)	16 (76,2%)	0,455
	HOSPITAL FLOOR	57 (14,8%)	3 (14,3%)	
	ICU	15 (3,9%)	2 (9,5%)	

TABLE 1: UNIVARIATE ANALYSIS FOR AF. CUALITATIVE VARIABLES

MATERIAL AND METHODS

Retrospective study collecting cases of OLT performed in our hospital from January 2002 to December 2014. The incidence of AF in the early postoperative period after OLT was analyzed. Multivariate analysis could not be performed because the number of patients with atrial fibrillation is too small.

		NOT AF	AF	P
BMI	KG/M²	26,30 ± 4,51	27,47 ± 4,08	0,247
AGE	YEARS	53,00 ± 8,91	59,00 ± 6,04	<0,001
UREA	MG/100ML	44,36 ± 30,34	56,79 ± 36,03	0,085
CREATININE	G/DL	1,09 ± 0,70	1,48 ± 1,60	0,280
RED BLOOD CELLS TRANSFUSED	UNITS	5,55 ± 6,29	10,14 ± 10,14	0,053
FROZEN PLASMA TRANSFUSED	UNITS	4,27 ± 5,66	8,90 ± 8,50	0,022
PLATELETS TRANSFUSED	UNITS	2,41 ± 3,89	4,76 ± 5,36	0,060
TOTAL BLOOD PRODUCTS TRANSFUSED	UNITS	12,22 ± 14,22	23,33 ± 22,89	0,039
SURGERY TIME	MINUTES	366,82 ± 109,11	414,29 ± 105,25	0,053
COLD ISCHEMIA TIME	MINUTES	432,44 ± 131,89	465,19 ± 132,41	0,269
ANHEPATIC TIME	MINUTES	54,27 ± 19,76	68,57 ± 32,18	0,057
HOSPITALIZATION TIME	DAYS	31,86 ± 27,40	35,29 ± 21,18	0,574
ICU TIME	DAYS	7,91 ± 9,84	17,38 ± 15,13	0,010
INTUBATION TIME	HOURS	28,09 ± 133,88	121,95 ± 279,61	0,142

TABLE 2: UNIVARIATE ANALYSIS FOR AF. CUANTITATIVE VARIABLES

		NOT AF	AF	P
REPERFUSION SYNDROME		98 (25,5%)	10 (47,6%)	0,025
INOTROPIC DRUGS DURING SURGERY	NONE OR ONE	221 (57,6%)	15 (71,4%)	0,209
	MORE THAN ONE	163 (42,2%)	28,6%	
REINTUBATION	YES	57 (14,8%)	9 (42,9%)	<0,001
	NOT EXTUBATION	4 (1,0%)	2 (9,5%)	
POST-SURGERY BLEEDING		63 (16,4%)	6 (28,6%)	0,147
REINTERVENTION		70 (18,3%)	8 (38,1%)	0,025
RETRANSPLANTATION		11 (2,9%)	2 (9,5%)	0,092
PRIMARY GRAFT FAILURE		5 (1,3%)	0	0,599
PORTA THROMBOSIS		7 (1,8%)	0	0,533
ARTERIAL THROMBOSIS		16 (4,2%)	3 (14,3%)	0,032
INFECTIOUS COMPLICATION	NEUMONIA	55 (14,3%)	6 (28,6%)	0,031
	WOUND	7 (1,8%)	2 (9,5%)	
	ABDOMEN	16 (4,2%)	2 (9,5%)	
	CATHETER BACTEREMIA	38 (9,9%)	0	
	OTHERS	22 (5,7%)	1 (4,8%)	
READMISSION TO UCI	YES	52 (13,5%)	2 (9,5%)	<0,001
	NOT LEFT	14 (3,6%)	5 (23,8%)	
DELAYED GRAFT FUNCTION		115 (29,9%)	6 (28,6%)	0,899
RENAL REPLACEMENT THERAPY AFTER		93 (24,2%)	10 (47,6%)	0,016

TABLE 3: UNIVARIATE ANALYSIS FOR AF. COMPLICATIONS

RESULTS AND DISCUSSION

Atrial Fibrillation appeared in 21 patients (5,2%). We found statistical association between AF and some donor factors: age ($53 \pm 8,9$ years for not AF vs $59 \pm 6,0$ years for AF patients; $p < 0,001$) and renal replacement therapy needed before the transplant (2,9% not AF vs 14,3% for AF patients; $p: 0,005$). During the surgery: reperfusion syndrome (25,5% for not AF vs 47,6% for AF patients; $p: 0,025$), requirements of frozen plasma ($4,2 \pm 5,66$ units for not AF vs $8,9 \pm 8,5$ units for AF patiens; $p: 0,022$) and total blood products ($12,2 \pm 14,2$ units for not AF vs $23,3 \pm 22,8$ units for AF patients; $p: 0,039$). Complications with statistical relevance after OLT: longer time at the ICU ($7,9 \pm 9,8$ for not AF vs $17,4 \pm 15,1$ days for AF patients; $p: 0,01$), readmission to the ICU rate (13,5% for not AF vs 9,5% for AF patients; $p < 0,001$), re intervention (18,3% for not AF vs 38,1% for AF patients; $p: 0,025$), re intubation (14,8% for not AF vs 42,9% for AF patients; $p < 0,001$), renal replacement requirements after the LT (24,2% for not AF vs 47,6% for AF patients; $p: 0,016$), arterial thrombosis (4,2% for not AF vs 14,3% for AF patients; $p: 0,032$), and infectious complications (Pneumonia 14,3% vs 28,6%; wound infection 1,8% vs 9,5%; abdomen infection 4,2% vs 9,5%; catheter related bacteraemia 9,9% vs 0%; and others 5,7% vs 4,8%; $p: 0,031$). Survival rates found after one year were: 82% for patients with no AF vs 47% for patients shown AF in the early postoperative period ($p < 0,001$).

CONCLUSION

At our centre, patients with AF in the early postoperative period after an OLT have more complications and longer ICU and hospital stays. But we cannot determine if AF is a cause or a consequence of those important differences. Further prospective studies need to be done.

1. Kirchhof, P, Benussi, S., Kotecha, D., Ahlsson, A., Atar, D., Casadei, B., ... & Hindricks, G. (2016). 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS The Task Force for the management of atrial fibrillation of the European Society of Cardiology (ESC) Developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESCEndorsed by the European Stroke Organisation (ESO). *European Journal of Cardio-Thoracic Surgery*, ezw313.
2. VanWagner LB, Serper M, Kang R, Levitsky J, Hohmann S, Abecassis M, Skaro A, Lloyd-Jones DM. Factors Associated With Major Adverse Cardiovascular Events After Liver Transplantation Among a National Sample. *Am J Transplant*. 2016;16:2684–2694.