

Tab. 1. Summary statistics and baseline characteristics of the study group of 184 patients after liver transplantation from deceased donors

	N = 184	Median/%	Inter-quartile range
Demography	age	53.6	43.4–59.4
	% of women	41.3	
	BMI (kg/m ²)	26.1	23.3–29.0
Etiology of cirrhosis	% alcohol	47.8	
	% viral etiology	12	
	% NAFLD	10.3	
	% AIH	9.8	
	% PBC	8.7	
	% PSC	8.2	
	% Wilson disease	2.2	
	% HCC	10.3	
ESLD characteristic	Child Pugh score	10	8–11
	MELD score	16	13.5–18.8
	INR	1.49	1.4–1.6
	Serum creatinine (μmol/l)	72	60.0–88.5
	Serum bilirubin (μmol/l)	51.3	35.3–96.6
	Serum albumin (g/l)	30.0	26.0–34.3
	Clinical ascites (%)	75.4	
	PSE (%)	59.9	
Blood group (BG)	% BG_0	23.9	
	% BG_A	48.9	
	% BG_AB	12.0	
	% BG_B	15.2	
	% Rh_posit	83.7	
Transplantation	Tacrolimus level Day 5	5.80	3.7–9.1
	Tacrolimus level on discharge	8.9	6.90–11.3
	Cold ischemia time (min.)	377.5	355.0–415.0
	% Acute cellular rejection	11.4	
	Follow-up time – months after LTx	37.4	15.2–71.5

NAFLD – non alcoholic fatty liver disease, AIH – autoimmune hepatitis, PBC – primary biliary cholangitis, PSC – primary sclerosing cholangitis, HCC – hepatocellular carcinoma, PSE – portosystemic encephalopathy

serum bilirubin following liver transplantation or evidence of worsening liver function. To confirm the diagnosis of TCMR, patients underwent percutaneous liver biopsy under ultrasound guidance using a true-cut needle (n = 12). In cases having contraindications to percutaneous liver biopsy (platelet count lower than $50\,000 \times 10^9/l$), trans-jugular liver biopsy (n = 9) was carried out. All patients reported an early form of TCMR histologically diagnosed at an interval of up to three months after LTx. Once TCMR was histologically confirmed, we treated patients with intravenous pulses of methylprednisolone with a cumulative dose of 3 grams (1 000 mg/day/3 days). In cases with inadequate response to steroids (a mild form of TCMR), we labeled TCMR as cortico-resistant, and patients received intravenous anti-thymocyte globulin (ATG) at a dose of 2.5–5 mg/kg/day for 14 days (a moderate and severe form of TCMR).

Statistical analysis was performed using a software package MedCalc v.18, Ostende, Belgium. We present all the numerical parameters as mean and standard deviation, categorical variables as percentages. Comparison of TCMR and no-TCMR groups was performed using T-test in normally distributed variables, Mann-Whitney-test in non-normally distributed variables and chi-square test in comparing proportions. To identify factors independently associated with TCMR, we entered all parameters appearing statistically associated with TCMR ($p < 0.12$) into a backward multivariate logistic regression. We analyzed the overall survival between sexes and TCMR and no-TCMR groups with

Kaplan-Meier survival curves. Statistical significance was defined by the probability of null-hypothesis inferior to 0.05.

The study has been carried out following the proceedings of the Helsinki declaration. All the patients have signed an informed consent before any procedure, and separately for liver transplantation. The study has a retrospective design; data were anonymized in the database and patients did not undergo any intervention apart from the usual procedures prior and post liver transplantation. All authors declare having no conflicts of interest. Dataset for this observational study is available on request from authors.

Results

During the reporting period, 196 consecutive DDLT were performed including 3 re-transplantations. The final analysis included 184 patients. Summary statistics and study group characteristics are displayed in table 1. Mean age was 53.6 (43.4–59.4), 41.3 % were females, with average MELD score 16.0 (13.5–18.8) points, mean Child-Pugh score 10.0 (8–11) points.

TCMR was diagnosed in 21 patients (11.4 %). Each of the patients had only one episode of TCMR. Six patients adequately responded to steroid pulse therapy, histologically, this was a mild form of TCMR. In 15 patients, the response was not adequate and they received second-line therapy with ATG, histologically, these were a mild and severe form of