Integrated clinical-histological (ICH) score system for the evaluation of “marginal” donors in kidney transplantation

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Introduction and aims: The organ shortage has led to increase the procurement of kidney from “marginal” donors and to improve the strategies to better evaluate the quality of these organs (1,2). The aim of this study was to identify an integrated clinical-histological (ICH) score that might improve the allocation of organs derived from marginal donors.

Methods: In a retrospective study, we analyze 326 recipients of single kidney transplantation from deceased donors, randomized in a Training Set (n°= 120) and a Test Set (n°=206) **(Fig.1).** We correlated clinical and histological variables with the glomerular filtration rate (GFR) at 12 months by linear regression in the Training Set; variables with p<0,05 were included in a multivariate analysis.

Results: The variables that statistically correlated with the 1-year renal function were donor age and total histological score (p< 0,05). Therefore, we defined an ICH score using the coefficients obtained by regression model: Score= (donor age x 0,5) + (total histological score x 3,4). Appling this ICH score system to the Test Set, the comparison of ROC curves between ICH score and the histological score showed a significant difference and ICH score was the most accurate (comparison between AUC = 0,099, p=0,008) **(Fig.2).** The ROC curve of ICH score has also defined a cut-off of 28,3 (sensitivity 86,2%, specificity 60%). Kaplan-Meier curves showed that patients with ICH score less than 28,3 have a better 10-years graft survival (85% versus 65%, LogRankTest p=0,0001) **(Fig.3).**

Conclusions: Our analysis show that the combination of clinical and histological data in an ICH score might significant improve the ability to allocate kidney from marginal donors.

	TRAINING SET (n°120)	TEST SET (n°206)	P
RECIPIENT CHARACTERISTICS			
Age (years)	47.8 ± 10.8	47.9 ± 10.7	Ns
Gender (M/F)	65% / 35%	65.5% / 34.5%	Ns
Type of dialysis (HD/PD)	90.8% / 9.2%	83.7% / 16.3%	Ns
Creatinine clearance at 1 year (ml/min)	63.2 ± 27.5	62.3 ± 26.3	Ns
DONOR CHARACTERISTICS			
Age (years)	47.8 ± 17.5	48.3 ± 16.9	Ns
Gender (M/F)	76.5% / 23.5%	63.7% / 36.3%	Ns
Cause of death (trauma/vascular)	45.8% / 54.2%	37.6% / 62.4%	Ns
Hypertension (yes/no)	29.2% / 70.8%	28.4% / 71.6%	Ns
HLA mismatch	3.2 ± 0.9	3.1 ± 0.9	Ns
Creatinine clearance (ml/min)	79.1 ± 26.4	89.4 ± 38.1	Ns
Cold ischaemia time (hours)	13.8 ± 4.2	14.1 ± 4.7	Ns
Total histological score	1.92 ± 1.8	1.81 ± 1.8	Ns

Fig.1: Clinical and histological characteristics of study population

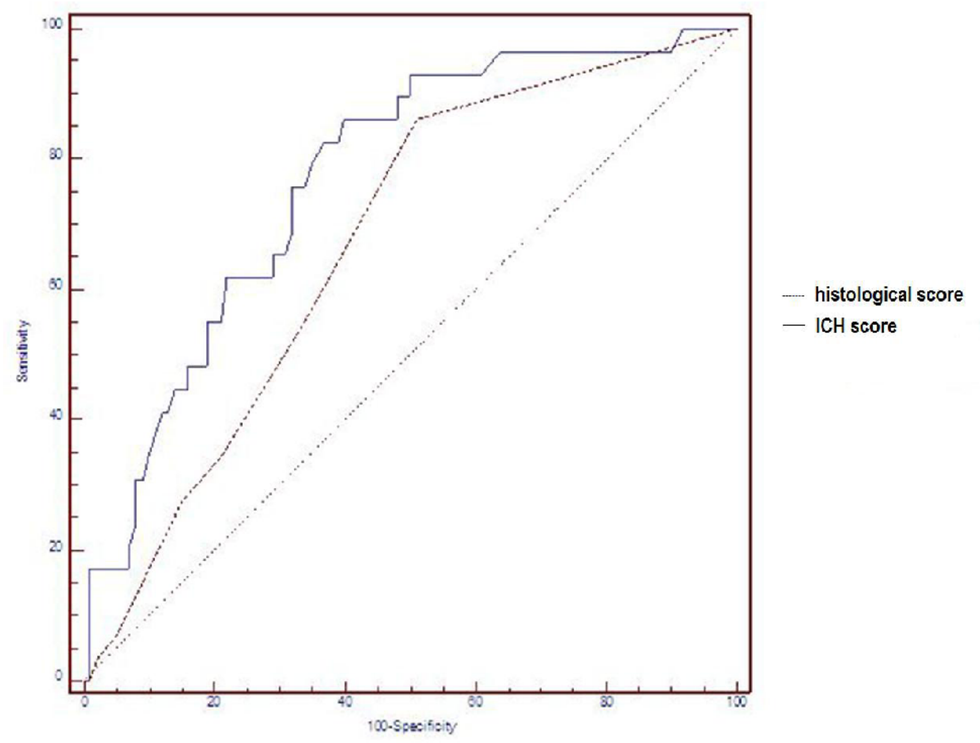

Fig.2: Comparison between ROC curves of ICH score and histological score

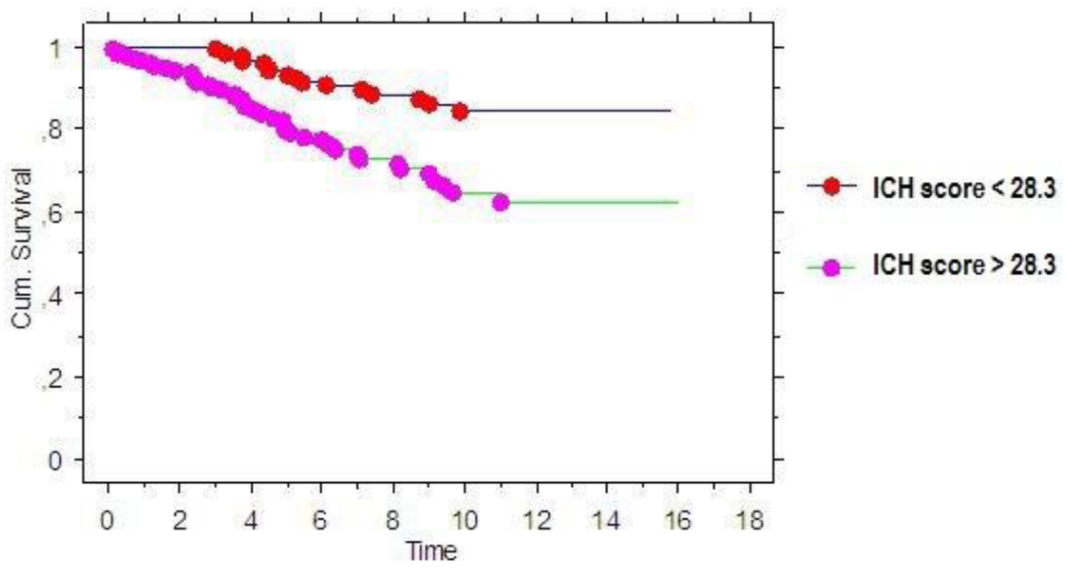

Fig.3: Comparison between Kaplan-Meier curves according to ICH score

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DOI: 10.3252/pso.eu.52era.2015