



**ANNUAL
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ISTANBUL, TURKEY & ONLINE
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**PROMOTING EXCELLENCE IN
LIVER TRANSPLANTATION**

Impact of donor age over 70 years in donation after circulatory death liver transplantation : 15 years of experience

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Disclosure

In relation to this presentation, I declare that there are no conflicts of interest.



BACKGROUND

- The disparity between the limited number of donor organs and the number of patients referred for liver transplantation (LT) is associated with significant mortality on the waiting list (1).
- In response to this severe shortage, extended criteria donors such as donation after circulatory death (DCD 3) donors have been proposed as a means to increase the pool of hepatic grafts despite a higher risk of primary non-function (PNF) and ischemic cholangiopathy (IC), particularly in donors above 50 years (2-3).
- In this study, we evaluated the results after DCD 3 LT using grafts from donors over 70 years compared to younger grafts (<70 years) particularly on graft survival and the rate of post-transplant biliary complications.

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(3) Mathur AK, Heimbach J, Steffick DE, Sonnenday CJ, Goodrich NP, Merion RM. Donation after cardiac death liver transplantation: predictors of outcome. *Am J Transplant* 2010;**10**:2512-2519



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METHODS

- All consecutive DCD 3 LT performed between January 2003 and November 2020 were studied retrospectively (n=228) comparing donors ≥ 70 years (n=53) and < 70 years (n=175)
- All procurement performed according with super rapid recovery technique in OR
- Liver grafts were allocated according to the Eurotransplant organization rules for Belgium (center-oriented allocation)
- Follow-up was completed until 1st January 2022, allowing a minimum follow-up of 1 year for every patient
- The two age groups were compared in terms of graft and patient survivals at 1, 3 and 5 years, in terms of donor and recipient demographics, transplant conditions and laboratory values.

RESULTS

Table 1: Characteristics of the graft recipients

Recipient variables	Overall (n=228)	Donor age<70 years (n=175)	Donor age≥70 years (n=53)	p-value
Recipient age, years	57.6 ± 10.7	56.8 ± 11.2	60.3 ± 8.3	0.0352
Sex ratio (M : F)	179 (79%) - 49 (21%)	137 (78%) - 38 (22%)	42 (79%) - 11 (21%)	0.882
Recipient laboratory MELD, points	16.6 ± 8.0	16.7 ± 8.2	16.2 ± 7.3	0.8175
Underlying liver				
-HCC in cirrhotic liver	68	49	19	
-Other cancer	7	6	1	
-Cirrhosis	151	118	33	
	2	2	0	

Values are median (i.q.r.). MELD, Model for End-stage Liver Disease; HCC, hepatocellular carcinoma.



Table 2. Baseline characteristics of donors

Donor and graft variables	Overall (n=228)	Donor age<70 years (n=175)	Donor age≥70 years (n=53)	p-value
Donor age (years)	56.5 ± 15.7	50.8 ± 13.4	75.1 ± 4.2	0.0001
Sex ratio (M : F)	141 (62%) - 87 (38%)	107 (61%) - 68 (39%)	34 (64%) - 19 (36%)	0.693
Donor BMI (kg/m ²)	26.01 ± 10.5	25.9 ± 11.6	26.4 ± 5.3	0.2435
Donor ICU stays (days)	9.1 ± 8.6	9.4 ± 9.3	8.3 ± 5.7	0.9397
Donor total warm ischemia (min)	19.4 ± 6.9	19.3 ± 6.8	19.9 ± 7.2	0.5178
Donor asystolic warm ischemia (min)	9.0 ± 2.6	8.9 ± 2.4	9.5 ± 3.2	0.0454
Cold storage (min)	253 ± 72	259 ± 72	235 ± 68	0.0120

Values are median (i.q.r.). BMI: Body Mass Index



Table 2. Baseline characteristics of donors

	Overall (n=228)	Donor age<70 years (n=175)	Donor age≥70 years (n=53)	p-value
Cause of death				0.118
Anoxia (n /%)	Anoxia : 128 (56%)	Anoxia : 104 (59%)	Anoxia : 24 (45%)	
Trauma (n/%)	Trauma : 37	Trauma : 27	Trauma : 10	
Stroke (n/%)	(16%)	(16%)	(19%)	
Neuro Other (n%)	Stroke : 51 (23%)	Stroke : 33 (19%)	Stroke : 18 (34%)	
Euthanasia (n/%)	Neuro other : 3	Neuro other : 3	Neuro other : 0	
Other (%)	(1%)	(2%)	(0%)	
	Euthanasia : 6 (3%)	Euthanasia : 6 (3%)	Euthanasia : 0 (0%)	
	Other : 3 (1%)	Other : 2 (1%)	Other : 1 (2%)	
Donor Risk Index	2.27 ± 0.42	2.14 ± 0.40	2.67 ± 0.24	0.0001
Donor AST	57.2 ± 49.9	58.9 ± 53.7	52.6 ± 34.2	0.6704
Values are median (I.q.r.). CH: cerebral hemorrhage				



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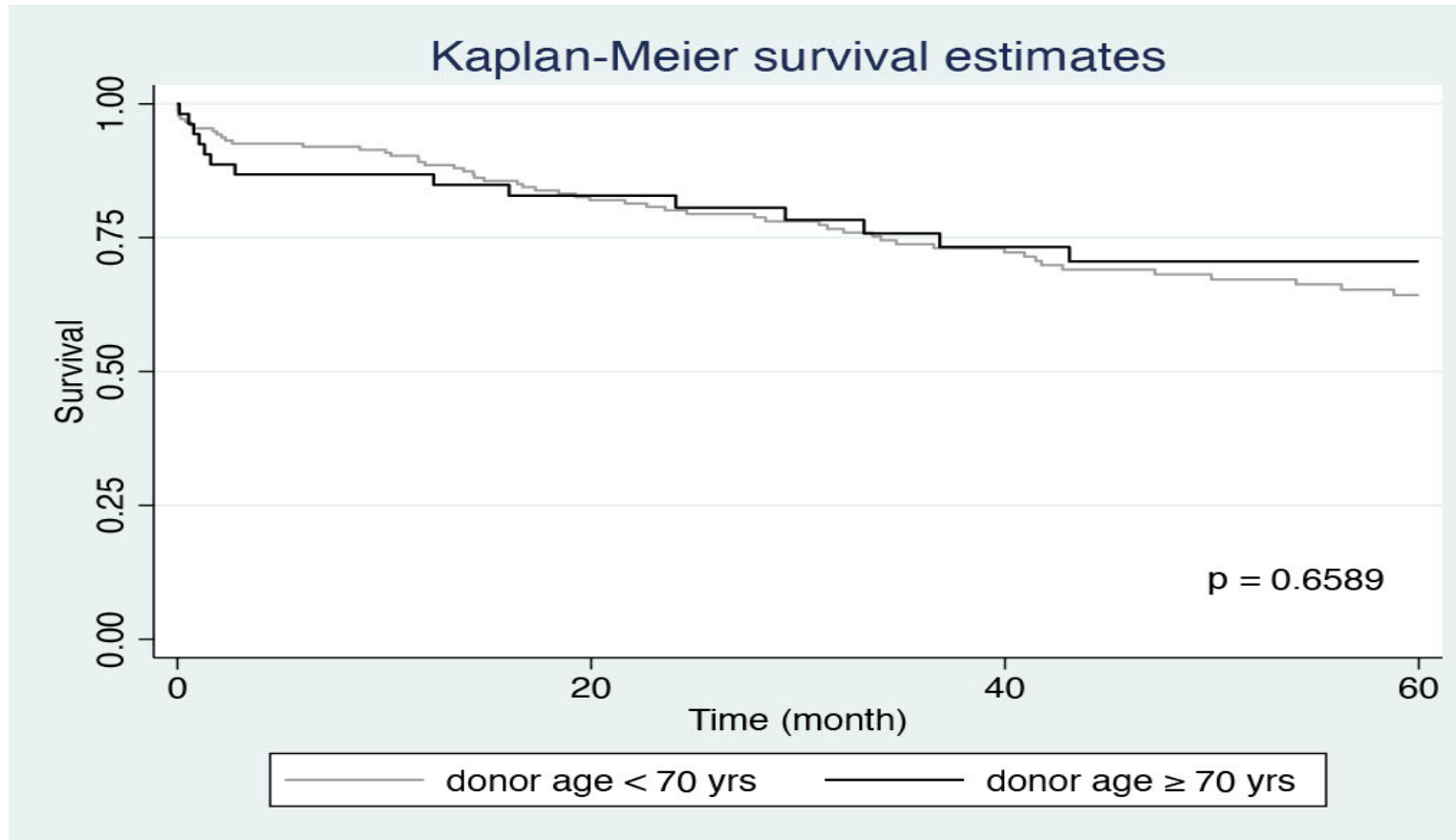


Figure 1: Overall graft survival between the two groups in the donation after circulatory death cohort after 1, 3 and 5 years.



Table 3. Post-transplant complications in DCD LT

	Donor <70 years (n=175)	Donor > 70 years (n=53)	P-value
Biliary complications (n,%)			
Fistula	Biliary fistula : 9 (5.1%)	Biliary fistula : 4 (7.6%)	Biliary fistula : 0.508
Anastomotic stricture	Anast strict: 20 (11.4%)	Anast strict: 7 (13.2%)	Anast strict: 0.725
NAS	NAS 8/175 (4,6%)	NAS : 1/53 (1,9%)	NAS: 0,379
Graft loss due to NAS	Graft loss due to NAS :0	Graft loss due to NAS : 0	
Peak AST (units/l)	1561 ± 2151	2201 ± 2703	0.0404
Peak total bilirubin (mg/dl)	4.45 ± 3.62	5.59 ± 5.18	0.3033
Primary non-function	4/175 (2.3%)	2/53 (3.8%)	0.553
Hepatic artery thrombosis	9/175 (5.1%)	1 (1.9%)	0.311



DISCUSSION :

- This study of a large single centre shows good results for DCD 3 LT, even with grafts from older donors when both donation warm ischaemia and, in particular, cold ischaemia times are kept to a minimum
- One of the notable aspects of this study is the shortest cold ischaemia reported so far for DCD liver transplantation (1). From our point of view, it may be the key explanations for the absence of graft loss due to non-anastomotic stricture
- Donor advanced age does not appear to compromise these results, as no difference between acute rejection, biliary strictures, hepatic artery thrombosis or retransplantation was demonstrated between DCD liver grafts from young donors and those from septuagenarian.



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CONCLUSION

- Donor age limit in DCD3 LT remains a challenging issue
- In our study, results for DCD LT from 70-yr-old grafts were similar to those from younger donors.
- Advanced donors is not a risk factor per se for DCD liver transplants and should not be discarded for liver donation if other donor risk factors (such as cold ischemia time and graft quality) are limited