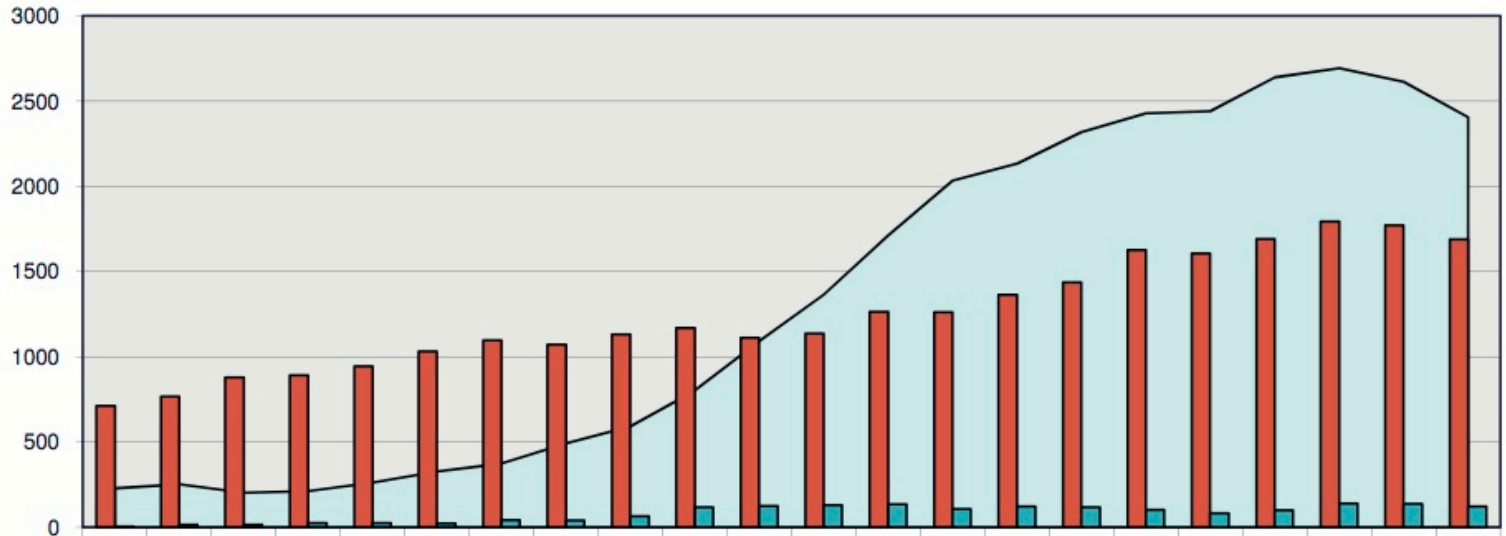
DCD liver transplantation: is donor age an issue?

O.Detry, H LeDinh, P Honoré, MF Hans, J Monard, MH Delbouille, S Lauwick, JP Squifflet, A. Deroover, M.Meurisse

Dpt of Abdominal Surgery & Transplantation
CHU Liège, University of Liege, Belgium

16TH CONGRESS OF THE EUROPEAN SOCIETY FOR ORGAN TRANSPLANTATION
PUSHING THE LIMITS

Conflict of Interest



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Liver waiting list	229	253	203	212	263	327	374	492	593	803	1093	1366	1714	2035	2134	2319	2429	2442	2641	2695	2614	2406
Deceased donor transplants	710	765	878	892	944	1032	1097	1071	1132	1168	1112	1136	1264	1262	1364	1436	1625	1606	1692	1793	1770	1689
Living donor transplants*	5	15	14	24	25	22	41	38	64	116	124	129	133	106	121	116	101	82	99	138	135	121

Eurotransplant annual report 2012

DCD in liver transplantation

- Shortage of organ donors
- Waiting time and mortality on waiting lists
- DCD has been proposed to increase the pool

- Increased risk of PNF
- Increased risk of ischemic bile duct lesions (IBDL)

- Decreased graft and patient survival
- Increase risk of retransplantation

DCD in liver transplantation

- Donor age is an independant risk factor of graft failure after DBD liver transplantation

- Aged livers are more susceptible to ischemia/reperfusion injury
- Aged livers have less regenerative capacity
- Aged livers increase the risk of HCV recurrence

DCD in liver transplantation

DCD liver Tx and age

- Recommendations:

  DCD donors > 45-50 years should not be used for liver transplantation

Durand, 2008, Liver Transpl

DCD LTx in Liège

- Program started in 2002 – all controlled DCD
- No particular selection compared to regular DBD donation

- Center oriented allocation, short cold ischemia
- Controlled DCD in OR with heparin & comfort therapy
- Low MELD score
  - HCC
  - Cirrhosis with encephalopathy and/or refractory ascitis
  - other (neurendocrine MTST)

- Aim: analyse our results according to donor's age

Methods

- Retrospective evaluation of a prospective database of 70 consecutive DCD LTx
- Comparison of 3 age groups:
  - < 56 y: n=32
  - 56-69 y: n=20
  - >69 y: n=18

- dWIT: from withdrawal to aortic perfusion
- Results: Median (IQR)
- Mean follow-up: 36 months

Donors' characteristics

	<56 y (n=32)	56-69 y (n=20)	>69 y (n=18)	*P*
Age (years)	44 (35.5-50.7)	62.5 (59-66.7)	73 (70-77)	<0.0001
DRI	1.8 (1.5-2.1)	2.3 (2.1-2.4)	2.6 (2.5-2.7)	<0.0001
Intensive care stay (days)	5 (4-8)	6.5 (5-8.7)	6.5 (3.7-9.2)	NS
Na (mmol/L)	145 (139-149)	143 (139-147)	141 (136-148)	NS
Total bilirubin (mg/dL)	0.38 (0.3-0.66)	0.3 (0.3-0.67)	0.44 (0.3-0.82)	NS
AST (UI/mL)	39.5 (24.7-59.7)	38 (23.5-69)	36 (26-69)	NS
GGT (UI/mL)	40 (27-118)	67 (39-118)	39 (24-92)	NS

Donors' characteristics

	<56 y (n=32)	56-69 y (n=20)	>69 y (n=18)	*P*
Age (years)	44 (35.5-50.7)	62.5 (59-66.7)	73 (70-77)	<0.0001
DRI	1.8 (1.5-2.1)	2.3 (2.1-2.4)	2.6 (2.5-2.7)	<0.0001
Intensive care stay (days)	5 (4-8)	6.5 (5-8.7)	6.5 (3.7-9.2)	NS
Na (mmol/L)	145 (139-149)	143 (139-147)	141 (136-148)	NS
Total bilirubin (mg/dL)	0.38 (0.3-0.66)	0.3 (0.3-0.67)	0.44 (0.3-0.82)	NS
AST (UI/mL)	39.5 (24.7-59.7)	38 (23.5-69)	36 (26-69)	NS
GGT (UI/mL)	40 (27-118)	67 (39-118)	39 (24-92)	NS

Procurement and Transplantation Characteristics

	<56 y (n=32)	56-69 y (n=20)	>69 y (n=18)	*P*
HTK/UW (n)	28/2	15/5	17/1	NS
DWIT (min)	20 (15-22)	21 (17-28)	19 (15.5-26.7)	NS
Withdrawal phase (min)	10 (7-12)	13 (8-19)	9 (5.7-17.2)	NS
Acirculatory phase (min)	9 (8-10)	8 (7.2-10.7)	9 (7-10.2)	NS
Hepatectomy time (min)	23 (20.7-30.7)	24.5 (17.2-30.7)	22.5 (18.2-23.5)	NS
CIT (min)	236 (212-287)	245 (204-323)	210 (187-270)	NS
Suture time (min)	41 (36-47)	42 (38-46)	39 (33-44)	NS

Procurement and Transplantation Characteristics

	<56 y (n=32)	56-69 y (n=20)	>69 y (n=18)	*P*
HTK/UW (n)	28/2	15/5	17/1	NS
DWIT (min)	20 (15-22)	21 (17-28)	19 (15.5-26.7)	NS
Withdrawal phase (min)	10 (7-12)	13 (8-19)	9 (5.7-17.2)	NS
Acirculatory phase (min)	9 (8-10)	8 (7.2-10.7)	9 (7-10.2)	NS
Hepatectomy time (min)	23 (20.7-30.7)	24.5 (17.2-30.7)	22.5 (18.2-23.5)	NS
CIT (min)	236 (212-287)	245 (204-323)	210 (187-270)	NS
Suture time (min)	41 (36-47)	42 (38-46)	39 (33-44)	NS

Recipients' characteristics

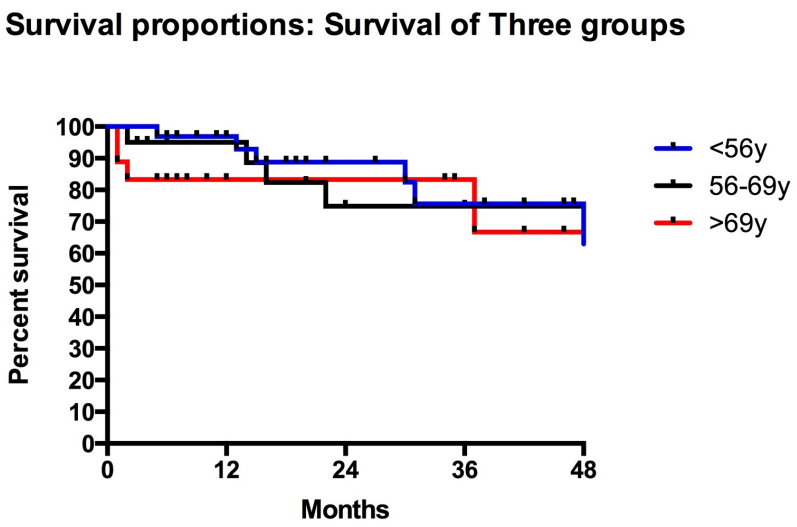
	<56 y (n=32)	56-69 y (n=20)	>69 y (n=18)	*P*
Age (years)	58 (51-63)	59.5 (50.7-64)	58.5 (51.7-64.2)	NS
Male (%)	90	81	83	NS
Liver disease (*n*)				
HCC	14	12	5	
Cirrhosis	14	8	13	
Other (CCK, NET, HAT)	4	0	0	
MELD	14.5 (11.2-17.7)	14 (10-18.5)	16 (14-24)	NS

Results

	<55y (n=32)	56-69y (n=20)	>69y (n=18)	*P*
Peak bilirubin (mg/dL)	2.7 (1.9-5.3)	3.1 (1.2-6.3)	4.5 (2.6-6.5)	NS
Peak AST (UI/mL)	1163 (715-2693)	1416 (587-2825)	1068 (699-3078)	NS
PNF (n)	0	0	0	
Retransplantation (n)	1 (HAT)	0	0	
Biliary complications				
fistula	0	1	2	
stenosis	2	2	1	
IBDL	0	0	0	

Graft and patient survivals

	<55y (n=32)	56-69y (n=20)	>69y (n=18)	*P*
Patient				NS
1 year	96%	95%	83%	
3 years	75%	74%	83%	
Graft				NS
1 year	93%	95%	83%	
3 years	73%	74%	83%	



Discussion

- Age > 55 y not a contra-indication for DCD donation
- Short WIT and CIT
- As CVA is more frequent in >55 year-old population, aged DCD donors might be a significant source of liver grafts

LIVER TRANSPLANTATION 15:1028-1035, 2009

ORIGINAL ARTICLE

Liver Transplantation Using Controlled Donation After Cardiac Death Donors: An Analysis of a Large Single-Center Experience

Hani P. Grewal,[1] Darrin L. Willingham,[1] Justin Nguyen,[1] Winston R. Hewitt,[1] Bucin C. Taner,[1] Danielle Cornell,[2] Barry G. Rosser,[1] Andrew P. Keaveny,[1] Jamie Aranda-Michel,[1] Raj Satyanarayana,[1] Denise Harnois,[1] Rolland C. Dickson,[1] David J. Kramer,[3] and Christopher B. Hughes[1]

[1]Department of Transplantation, Mayo Clinic, Jacksonville, FL; [2]LifeQuest Organ Recovery Services, Gainesville, FL; and [3]Department of Critical Care Medicine, Mayo Clinic, Jacksonville, FL

The use of donation after cardiac death (DCD) donors may provide a valuable source of organs for liver transplantation. Concerns regarding primary nonfunction (PNF) and intrahepatic biliary stricture (IHBSs) have limited the enthusiasm for their use. A retrospective analysis of 1436 consecutive deceased donor liver transplants performed between December 1998 and October 2006 was conducted. These included 108 DCD liver transplants, which were compared to 1328 transplants performed with organs from donors meeting the criteria for donation after brain death (DBD). The median follow-up was 48 months. The 1-, 3-, and 5-year patient survival and graft survival for DCD donors were 91.5%, 88.1%, and 88.1% and 79.3%, 74.5%, and 71.0%, respectively. The 1-, 3-, and 5-year patient survival and graft survival for DBD donors were 87.3%, 81.1%, and 77.2% and 81.6%, 74.7%, and 69.1%, respectively. Patient survival and graft survival were not significantly different between DCD donors less than 60 years old, DCD donors greater than 60 years old, and DBD donors. Causes of graft loss included IHBSs (n = 9), PNF (n = 4), recurrent hepatitis C virus (n = 4), hepatic artery thrombosis (n = 1), rejection (n = 2), and patient death (n = 13). Contrary to previously published data, excellent long-term patient survival and graft survival can be obtained with DCD allografts, and in our experience, they are equivalent to those obtained from DBD allografts. ***Liver Transpl 15: 1028-1035, 2009.***

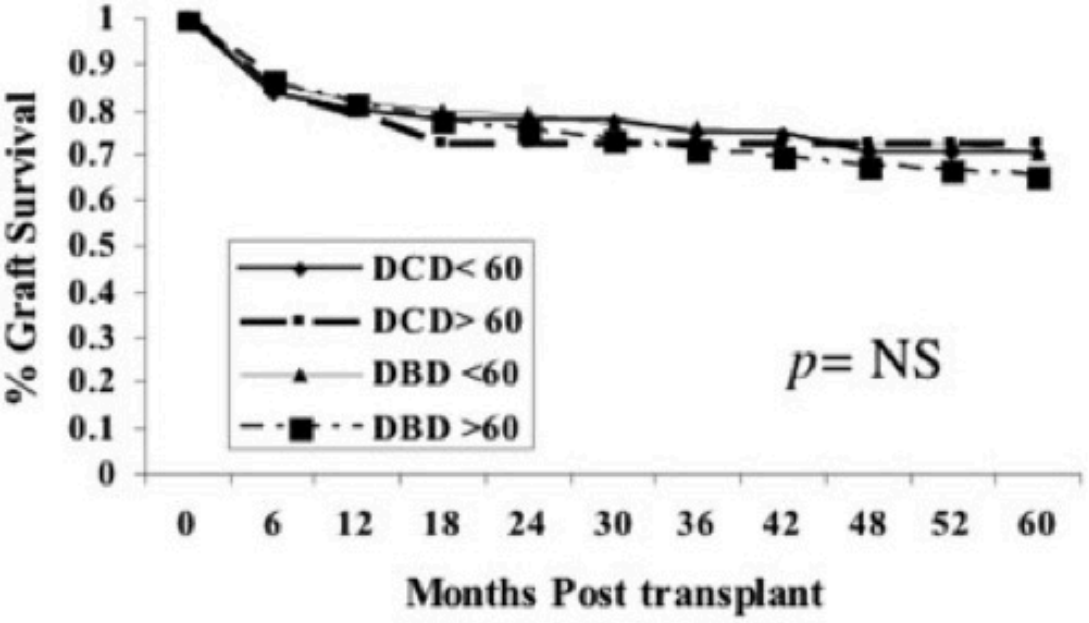


Figure 5. Graft survival versus the time after transplantation. Abbreviations: DBD, donation after brain death; DCD, donation after cardiac death; NS, not significant.

Grewal, Liver Transpl, 2009

CHU de Liège

Université de Liège

Thank you !

ESOT the International Transplant Congress®