

CHAPTER 4

LIVER TRANSPLANTATION

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4.0 INTRODUCTION

Liver transplantation is the treatment of choice in many patients with end stage liver failure and in some patients with acute liver failure. Liver transplantation in Malaysia has evolved significantly in the recent years. Although the expertise is available in Malaysia, the lack of cadaveric organs has significantly hindered the development of the transplant programme in Malaysia. The poor cadaveric organ donation rate in Malaysia is due to several reasons including public apathy and the reluctance of medical personnel to explore this option in a brain dead patient.

4.1 STOCK AND FLOW

The number of liver transplants performed from 1993 to 2006 is 88. Seventy-four (84%) were performed locally and 14 (16%) were performed at overseas centres. Eight new liver transplants were done in 2006 and they were all done locally.

Table 4.1.1: Stock and Flow of Liver Transplantation, 1993-2006

Year	93	94	95	96	*97	98	99	00	01	02	**03	04	05	06
New transplant patients	1	1	8	13	3	2	8	3	5	10	5	16	5	8
Deaths	0	0	3	4	1	0	4	1	2	5	1	4	4	3
Re-transplant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lost to follow up	0	0	0	0	0	0	0	1	0	1	0	1	1	0
Functioning graft at 31 st December	1	2	7	16	17	19	23	24	27	31	34	45	45	50

* 1 patient who was alive until 05/12/1997 is recorded dead with missing date of death

** 1 patient who had transplanted in 2003 is recorded as death with missing date of death

Figure 4.1.1: Stock and Flow of Liver Transplantation, 1993-2006

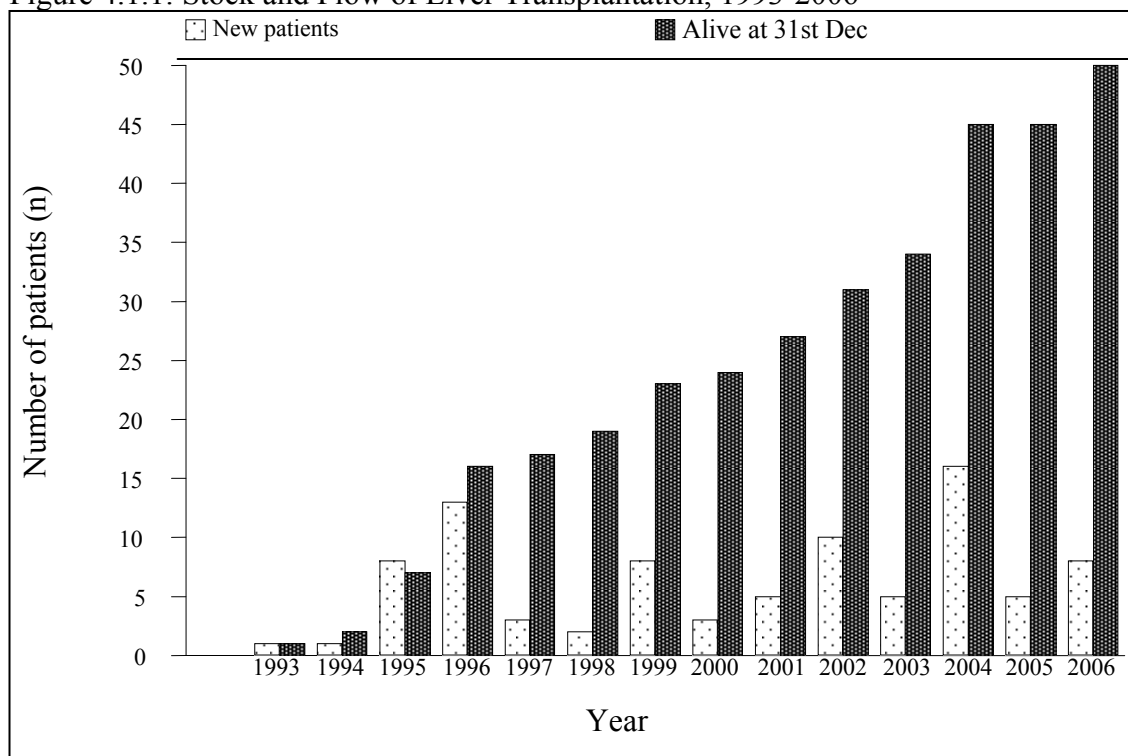


Table 4.1.2: Distribution of Patients by Place of Transplant, 1993-2006

Year	93	94	95	96	97	98	99	00	01	02	03	04	05	06	TOTAL
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Local	0	0	8	10	1	1	8	3	5	9	2	14	5	8	74
Overseas	1	1	0	3	2	1	0	0	0	1	3	2	0	0	14
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	88

Table 4.1.3: Distribution of Patients by Centres for Liver Transplantation, 1993-2006

Year	93	94	95	96	97	98	99	00	01	02	03	04	05	06	TOTAL
Centre	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Subang Jaya Medical Centre	0	0	8	10	1	1	8	3	5	6	2	7	0	0	51
Hospital Selayang	0	0	0	0	0	0	0	0	0	3	0	7	5	8	23
Australia	1	0	0	3	1	0	0	0	0	0	0	0	0	0	5
National University Hospital, Singapore	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
Kings College Hospital, UK	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Tianjin, China	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
Asian Centre for Liver Disease & Transplantation, Singapore	0	0	0	0	0	0	0	0	0	1	2	1	0*	0*	4
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	88

* Data not reported

Table 4.1.4: Distribution of Transplant Recipients by Follow-up Centres, 2006

Centre	No.	%
Number of patient with functioning graft at 31st December 2006	50	100
Kuala Lumpur Hospital	2	4
SJMC	27*	54
Selayang Hospital	17	34
Singapore	1*	2
UMMC	3	6

*Follow-up data not reported

4.2 RECIPIENTS' CHARACTERISTICS

Fifty (57%) were males and 38 (43%) were females. The ethnic distribution of the liver transplant recipients are as follows: Chinese 44 (50%), Malays 35 (40%), Indians 7 (8%), Others 2 (2%).

Seventy-five (85%) of the transplant recipients were between 1 and 9 years of age at the time of transplantation. Biliary atresia was the primary liver disease in 63 (72%) of the recipients. The commonest indication for liver transplantation was failure to thrive with growth retardation and poor liver function. The commonest blood group amongst the liver transplant recipients was group O.

Table 4.2.1: Distribution of Patients by Gender, 1993-2006

Year	93	94	95	96	97	98	99	00	01	02	03	04	05	06	TOTAL
Gender	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Male	0	0	6	5	2	1	3	1	2	7	5	10	2	6	50
Female	1	1	2	8	1	1	5	2	3	3	0	6	3	2	38
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	88

Figure 4.2.1: Distribution of Patients by Gender, 1993-2006

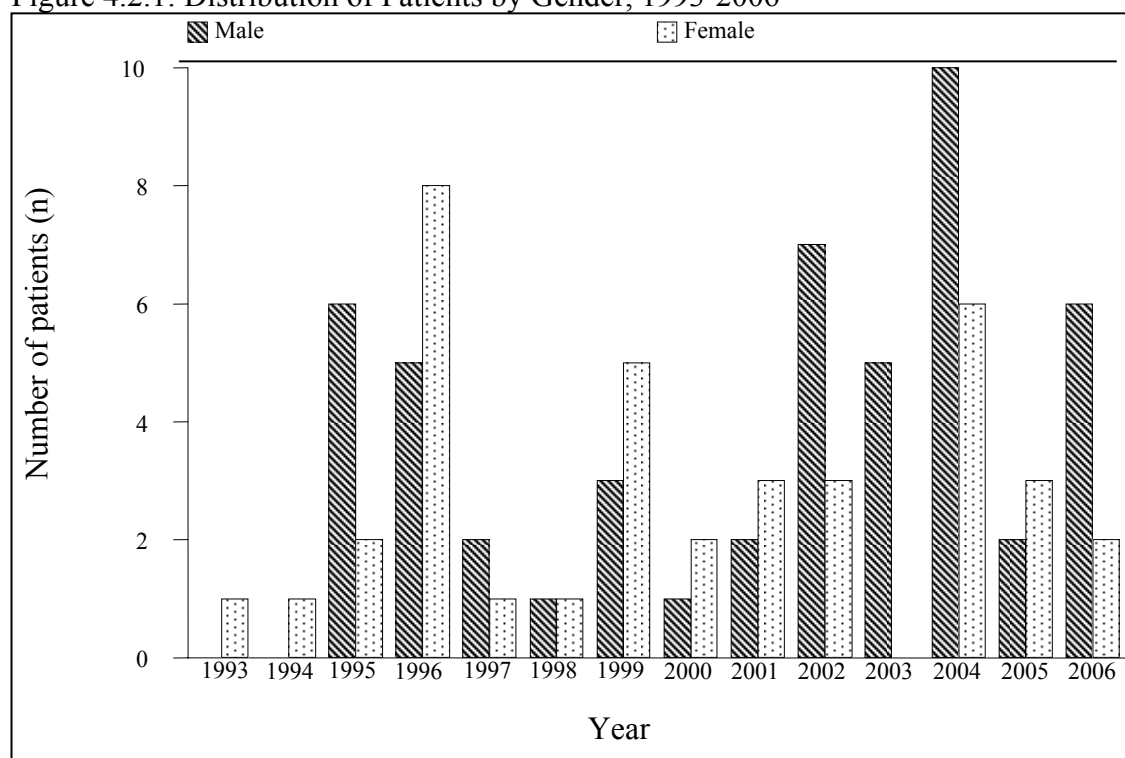


Table 4.2.2: Distribution of Patients by Ethnic Group, 1993-2006

Year	93	94	95	96	97	98	99	00	01	02	03	04	05	06	TOTAL
Ethnic group	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Malay	0	1	2	3	1	0	4	1	2	3	1	11	3	3	35
Chinese	1	0	6	8	2	1	2	2	3	6	4	5	1	3	44
Indian	0	0	0	2	0	1	1	0	0	0	0	0	1	2	7
Others	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	88

Figure 4.2.2: Distribution of Patients by Ethnic Group, 1993-2006

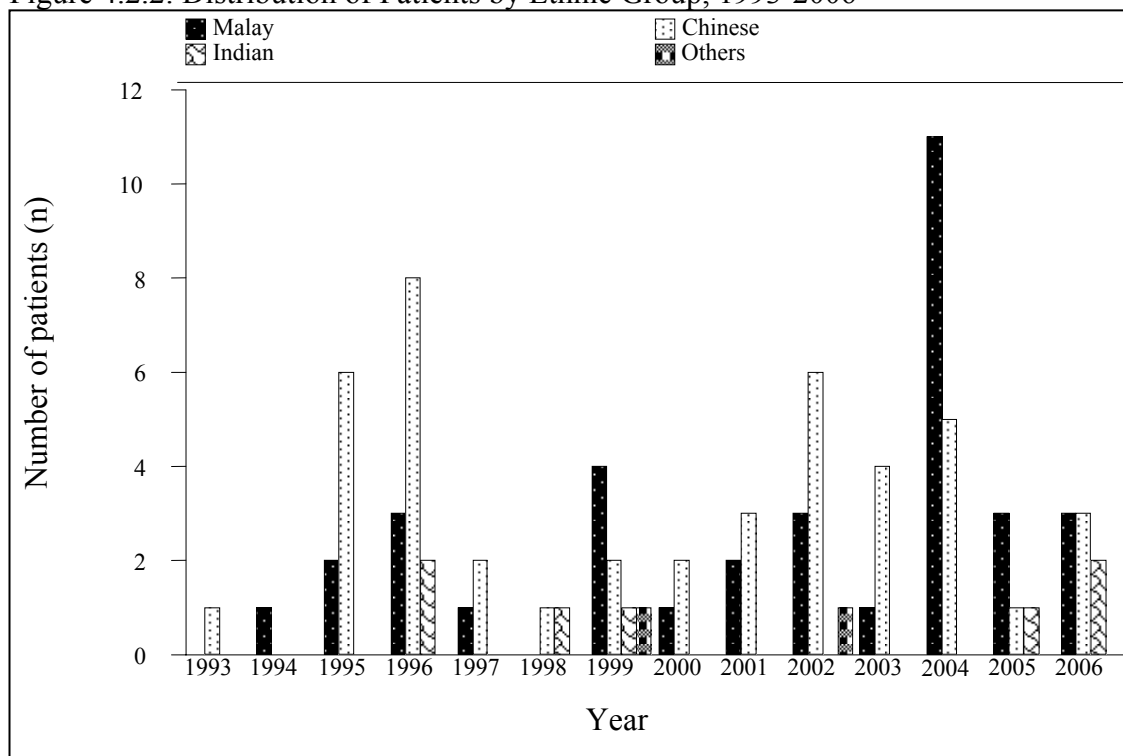


Table 4.2.3: Distribution of Patients by Age, 1993-2006

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	TOTAL
Age, years*	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
<1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
1-4	1	1	3	11	3	1	5	3	4	4	2	9	2	4	53
5-9	0	0	3	1	0	0	2	0	1	4	2	3	3	1	20
10-14	0	0	1	1	0	0	0	0	0	0	0	1	0	1	4
15-19	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2
20-39	0	0	1	0	0	0	0	0	0	1	0	0	0	2	4
40-59	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
>=60	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	88
Mean	2	4	9	4	2	1	4	1	2	6	18	12	4	12	7
SD	-	-	9	4	1	1	5	1	2	7	31	22	3	15	14
Median	2	4	6	2	2	1	3	1	2	4	7	3	5	5	2
Minimum	2	4	2	2	1	1	1	1	1	4 months	1	1	1	2	3 months
Maximum	2	4	30	14	2	1	15	2	5	24	73	74	8	39	74

* Age=date of transplant - date of birth

Table 4.2.4: Primary Diagnosis, 1993-2006 (N=88)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	TOTAL
Primary Diagnosis	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Biliary atresia	1	1	7	12	3	1	7	2	5	6	2	10	4	2	63
Metabolic liver disease	0	0	1	1	0	0	0	0	0	2	0	2	0	0	6
Cholestatic liver disease	0	0	0	0	0	1	0	1	0	0	0	0	1	0	3
Primary biliary cirrhosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Primary sclerosing cholangitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Autoimmune hepatitis	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Chronic hepatitis B	0	0	0	0	0	0	0	0	0	0	3	2	0	0	5
Chronic hepatitis C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alcoholic liver disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malignancies	0	0	0	0	0	0	0	0	0	1	2	1	0	0	4
Acute liver failure	0	0	0	0	0	0	0	0	0	0	0	1	0	3	4
Idiopathic / Cryptogenic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	2	0	1	1	4	8

Note: 6 patients have more than one primary disease

Table 4.2.5: Indication for Transplantation, 1993-2006 (N=88)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	TOTAL
Indication for Transplantation	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Recurrent encephalopathy	0	0	1	0	0	0	1	0	0	1	0	0	0	0	3
Uncontrolled bleeding varices	0	0	0	7	1	0	4	1	1	0	0	2	0	0	16
Intractable ascites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spontaneous bacterial peritonitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poor liver function	1	1	7	11	3	1	8	3	5	9	3	11	4	1	68
Malignancy	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Unacceptable quality of life	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2
Failure to thrive, growth retardation in paediatric patients	0	0	6	10	3	2	6	3	5	7	2	10	3	1	58
Others	0	0	0	0	0	0	0	0	0	0	0	1	2	8	11
No data	0	0	0	0	0	0	0	0	0	1	1	2	0	0	4

Note: 21 patients had 1 indication for transplantation, 63 had more than 1 indication for transplantation

Table 4.2.6: Recipient Blood Group, 1993-2006 (N=88)

Year	93	94	95	96	97	98	99	00	01	02	03	04	05	06	TOTAL
Blood group	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
A	0	1	2	0	0	0	3	0	1	3	1	4	1	4	20
B	0	0	1	2	0	1	2	0	1	1	0	1	1	3	13
AB	0	0	0	1	0	1	0	0	0	0	0	1	1	0	4
O	0	0	2	5	1	0	3	3	3	5	1	8	2	1	34
No data	1	0	3	5	2	0	0	0	0	1	3	2	0	0	17
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	88

4.3 TRANSPLANT PRACTICES

Eighty-one percent of liver transplants were living donor transplants while 19.3% were from cadaveric donors. Sixty-six percent of living donors were first degree relatives with mother-to-child being the most common.

The immunosuppressive medications most commonly used are tacrolimus and steroids.

Table 4.3.1: Distribution of Patients by Type of Donors, 1993-2006 (N=88)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	TOTAL
Type of Donors	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Cadaveric	1	0	0	3	1	0	0	0	0	1	1	4	2	4	17
Living related - Mother	0	1	5	2	1	2	5	2	2	2	2	7	1	1	33
Living related - Father	0	0	2	7	1	0	2	0	2	3	0	1	1	3	22
Living related - Son	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
Living related - Brother	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Living related - emotionally	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Living unrelated	0	0	1	1	0	0	1	1	1	3	0	3	0	0	11
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	4	8	87

* 1 patient is Living related - Other

Table 4.3.2: Immunosuppressive Drug Treatment at Transplantation, 1993-2006 (N=88)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	TOTAL
Immunosuppressive drugs	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Steroids	0	0	2	5	0	2	5	2	5	5	1	12	5	8	52
Azathioprine	0	0	0	0	0	0	0	0	0	0	0	4	5	8	17
Cyclosporin A	1	1	1	2	0	0	0	1	0	0	0	0	0	0	6
Tacrolimus (FK506)	0	0	3	7	2	2	8	2	5	9	5	12	5	8	68
Mycophenolate Mofetil (MMF)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rapamycin	0	0	0	0	0	0	0	0	0	1	2	0	0	0	3
Monoclonal / Polyclonal antibody	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anti IL2R Antibodies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No data	0	0	4	3	1	0	0	0	0	1	0	4	0	0	13
TOTAL patients	1	1	8	13	3	2	8	3	5	10	5	16	5	8	88

Note: 21 patients had 1 type of drug, 37 patients had 2 types, 17 patients had 3 types

4.4 TRANSPLANT OUTCOMES

The 1-year survival rate for the periods of 1993-1998 and 1999-2006 was 71% and 70% respectively. The most common cause of death was sepsis.

Table 4.4.1: Patient Survival by Year of Transplant, 1993-2006 (N=88)

Year of Transplant Interval (months)	1993 - 1998		1999 - 2006	
	% Survival	SE	% Survival	SE
1	82	7	83	5
6	71	9	70	6
12	71	9	70	6

SE=standard error

Figure 4.4.1: Patient Survival by Year of Transplant, 1993-2006

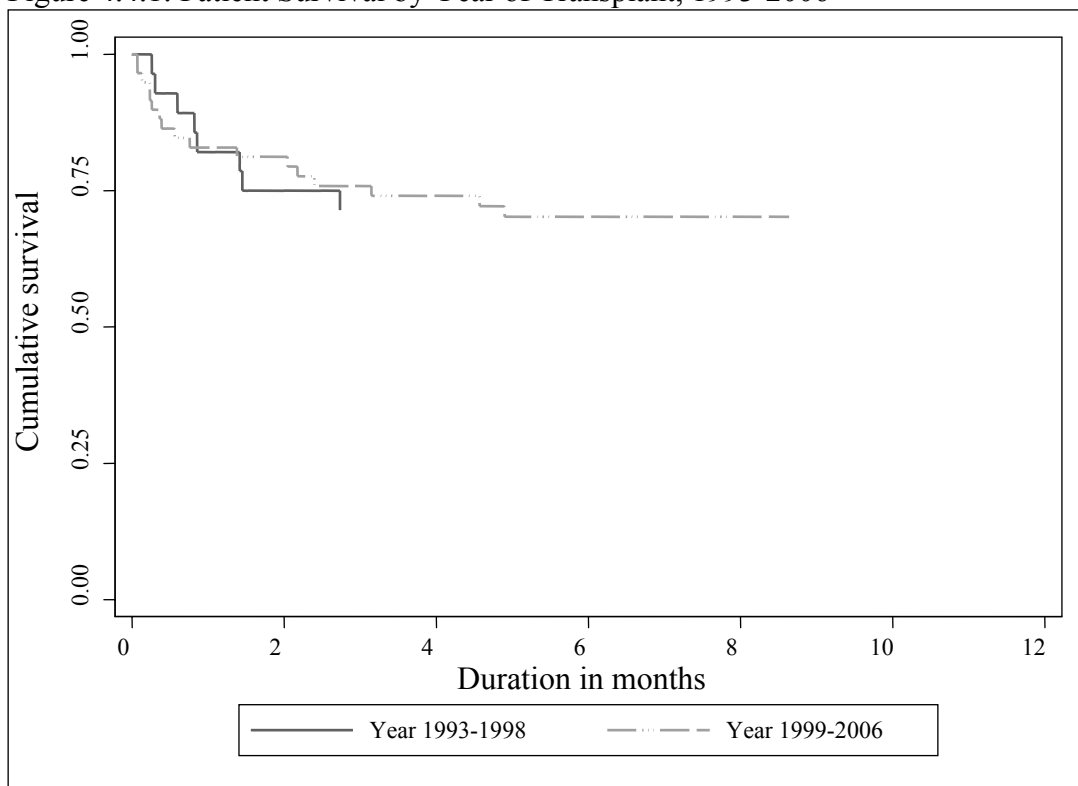


Table 4.4.2: Patient Survival by Gender, 1993-2006 (N=88)

Gender	Male		Female	
	% Survival	SE	% Survival	SE
Interval (months)				
1	82	5	84	6
6	71	6	70	8
12	71	6	70	8

SE=standard error

Figure 4.4.2: Patient Survival by Gender, 1993-2006

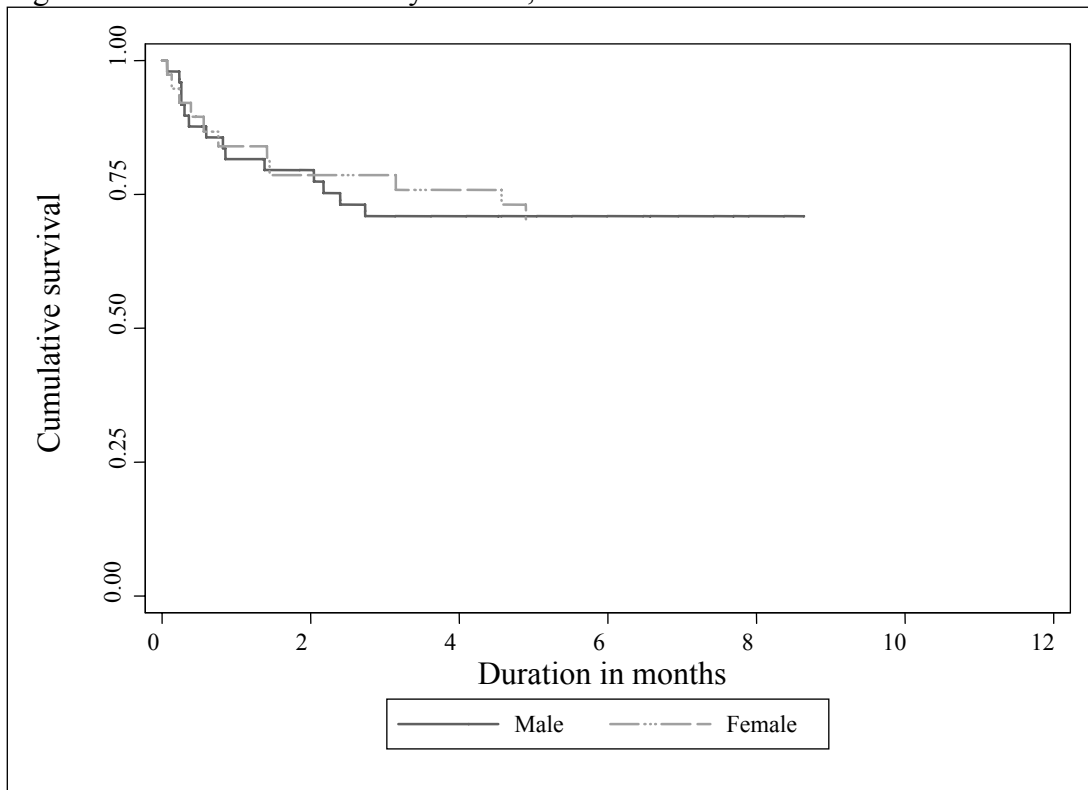


Table 4.4.3: Patient Survival by Age Group, 1993-2006 (N=88)

Age group	0-9 years		≥10 years	
Interval (months)	% Survival	SE	% Survival	SE
1	81	5	100	-
6	68	6	89	10
12	68	6	89	10

SE=standard error

Figure 4.4.3: Patient Survival by Age Group, 1993-2006

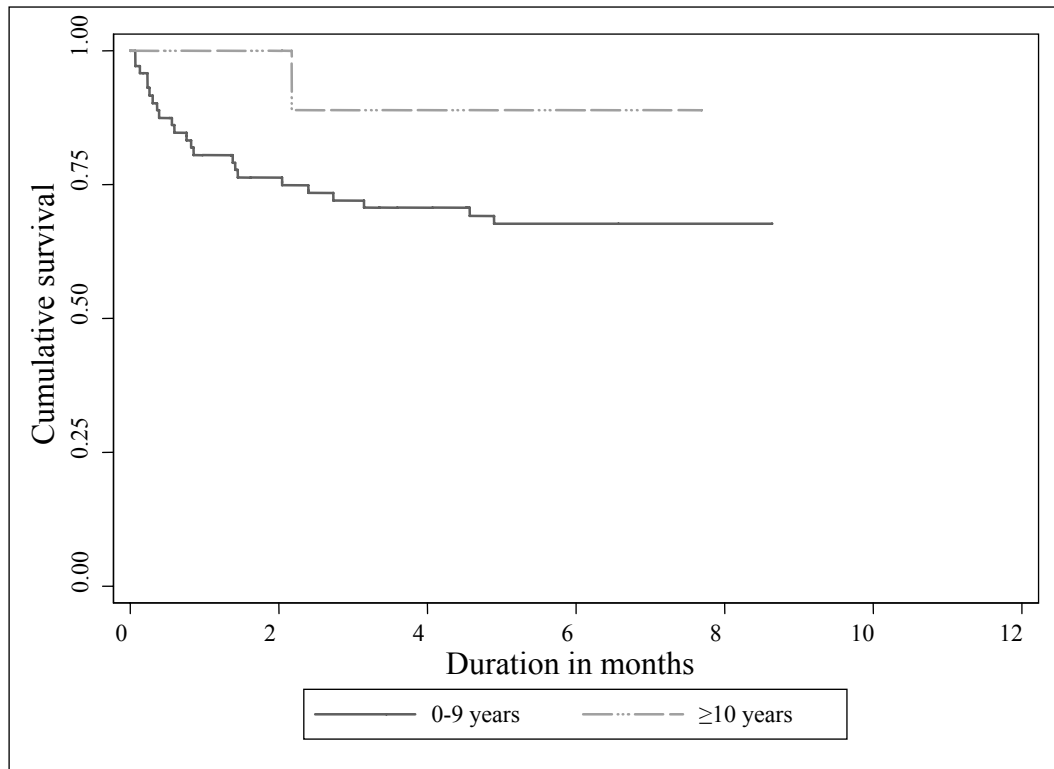


Table 4.4.4: Distribution of Patients by Cause of Death, 1993-2006 (N=88)

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	TOTAL
Causes of death	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Graft failure	0	0	0	0	0	1	0	0	0	0	2	0	3
Chronic graft rejection	0	0	0	0	0	0	1	0	0	0	0	0	1
Intra-abdominal Bleeding	0	0	0	0	0	0	0	0	1	0	0	0	1
Peritonitis	0	0	0	0	0	0	0	1	0	0	0	0	1
CMV Pneumonia	0	0	0	0	1	0	0	0	0	0	0	0	1
Decompensated liver cirrhosis	0	0	0	0	0	0	0	1	0	0	0	0	1
Intracranial haemorrhage	0	1	0	0	1	0	0	0	0	0	0	0	2
Malignancy	0	0	0	0	0	0	0	0	0	0	1	0	1
V ariceal bleed	0	0	1	0	2	0	0	0	0	0	0	0	3
Pneumonia and respiratory failure	0	1	0	0	0	0	0	0	0	0	0	0	1
Post transplant lymphoproliferative disease	0	0	0	0	0	0	1	0	0	0	0	0	1
Sepsis	0	2	0	0	0	0	0	2	0	1	1	3	9
Unknown	3	0	0	0	0	0	0	1	0	3	0	0	7
TOTAL	3	4	1	0	4	1	2	5	1	4	4	3	32

Note : 2 patients with no date of death