

## **NHS BLOOD AND TRANSPLANT**

### **LIVER ADVISORY GROUP**

#### **HEPATOCELLULAR CARCINOMA PATIENTS**

##### **SUMMARY**

##### **INTRODUCTION**

- 1 This paper presents information on first adult elective deceased donor transplants in patients with Hepatocellular Carcinoma (HCC) between 1 July 2008 and 31 December 2012. A patient has been defined as having HCC if their primary, secondary or tertiary liver disease has been recorded at transplant as either HCC – non-cirrhotic or HCC – cirrhotic.
- 2 For patients registered with HCC as their primary, secondary or tertiary liver disease at registration between 1 January 2010 and 31 December 2012, the median waiting time to transplant was analysed by alpha-fetoprotein (AFP) level.

##### **RESULTS**

- 3 There were 555 HCC liver transplants in the time period analysed. Of these, 468 had a maximum alpha-fetoprotein (AFP) level recorded at registration. 73% of patients transplanted with HCC had an AFP level of less than 50 iu/ml. Only 15 patients had an AFP level of greater than 1,000 iu/ml.
- 4 Of the 555 HCC transplants, 49 (9%) did not have information on the number and size of tumours recorded at registration. Of the remaining 506 transplants 174 (34%) had more than one tumour reported at registration. Of the 332 transplants with one tumour reported at registration, nine (3%) had a tumour greater than 5cm and less than or equal to 7cm in size.
- 5 Five year transplant survival of first elective adult liver only deceased donor transplants, for HCC patients was 61% compared with 80% for non-HCC patients and this was statistically significant (log-rank p-value<0.001).
- 6 For HCC patients with an AFP level >1,000iu/ml, the five year transplant survival rate was 53% (95% confidence interval (CI) 20%-78%), although the number of patients analysed was small. There was no statistically significant difference found in the transplant survival rate across the AFP level groups.
- 7 The median waiting time to transplant for HCC patients with an AFP level >1,000 iu/ml was 188 days (95%CI 116-260 days) showed those patients with an AFP level of <50 iu/ml waited on average 143 days compared to 94 days for those with an AFP level of 50-250 iu/ml.

##### **ACTION**

- 8 The Liver Selection and Allocation Working Party recommend lowering the level of AFP, at which it is an absolute contraindication to transplant, from 10,000 to 1,000 iu/ml.

**Claire Counter**  
**October 2013**

# NHS BLOOD AND TRANSPLANT

## LIVER ADVISORY GROUP

### HEPATOCELLULAR CARCINOMA PATIENTS

#### INFORMATION

- 1 This paper presents information on transplants and registrations of adult elective patients with Hepatocellular Carcinoma (HCC).

#### DATA AND METHODS

- 2 Data on first adult elective deceased donor liver only transplants in the UK between 1 July 2008 and 31 December 2012 were analysed. A patient was defined as having HCC if it was recorded as their primary, secondary or tertiary liver disease at transplant. The Kaplan-Meier method was used to estimate 5 year transplant survival. For transplant survival an event is defined as the earlier of graft failure or patient death. Outcomes are as recorded at 25 October 2013.
- 3 Data on registrations for a first adult elective liver transplant between 1 January 2010 and 31 December 2012 were analysed. A patient was defined as having HCC if it was recorded as their primary, secondary or tertiary liver disease at registration. The Kaplan-Meier method was used to estimate median waiting time to transplant.

#### RESULTS

- 4 There were 555 first adult elective deceased donor liver only transplants with HCC recorded at transplant in the time period. Of these 555, 468 had a maximum AFP level recorded at registration. The number of transplants by alpha-fetoprotein (AFP) level is shown in **Table 1**. The majority (73%) of patients transplanted with HCC had an AFP level of less than 50 iu/ml.

**Table 1 First adult elective deceased donor liver only transplants in patients with HCC reported at transplant, 1 July 2008 to 31 December 2012**

AFP level (iu/ml)	N	%
<50	342	73%
50-250	79	17%
251-500	18	4%
501-1000	14	3%
>1000	15	3%
<b>Total</b>	<b>468</b>	

- 5 Information on the number and size of tumours is shown in **Table 2**. Of these 555, 49 (9%) did not have information on the number and size of tumours recorded at registration. Of the remaining 506 transplants, 174 (34%) had more than one tumour reported at registration. Of 332 transplants with just one tumour reported at registration, nine (3%) had a tumour greater than 5cm and less than or equal to 7cm in size.

<b>Table 2 First adult elective deceased donor liver only transplants in patients with HCC reported at transplant, 1 July 2008 to 31 December 2012</b>			
<b>Number of tumours</b>	<b>Tumour &gt;5cm and ≤7cm</b>		<b>Total</b>
	<b>No</b>	<b>Yes</b>	
1	323	9	332
2	112	-	112
3	43	-	43
4	11	-	11
5	8	-	8
Unknown	-	-	49
<b>Total</b>	<b>497</b>	<b>9</b>	<b>555</b>

- 6 **Table 3** shows the distribution of the total diameter (cm) of tumours by tumour category. For patients with more than one tumour, with all tumours less than or equal to 3cm, the median total diameter was 4.1cm (inter-quartile range 3.1cm - 5.4cm).

**Table 3 Distribution of the total diameter of tumours reported in first adult elective transplants in patients with HCC reported at transplant, 1 July 2008 to 31 December 2012**

<b>Number and size of tumour group</b>	<b>N</b>	<b>Median (cm)</b>	<b>Interquartile Range</b>	<b>Min</b>	<b>Max</b>
1 tumour, diameter ≤5cm	323	2.7	2.0-3.5	0.3	5.0
1 tumour, diameter >5cm and ≤7cm	9	5.8	5.7-6.8	5.5	7.0
>1 tumour, each tumour ≤3cm	172 <sup>1</sup>	4.1	3.1-5.4	0.3	11.4

<sup>1</sup> Two patients had size of tumours missing

- 7 **Table 4** shows the median number of bed days defined as the number of days between transplant and discharge from hospital for HCC patients by AFP level, where AFP level and date of discharge were known.

**Table 4** Distribution of bed days for first adult elective transplants in patients with HCC reported at transplant by AFP level, 1 July 2008 to 31 December 2012

AFP level (iu/ml)	N	Median (days)	Interquartile Range	Min	Max
<50	315	14.0	10-18	1	83
50-250	75	15.0	11-20	5	96
251-500	18	12.0	11-13	6	45
501-1000	14	10.5	7-13	5	36
>1000	15	15.0	11-20	7	38

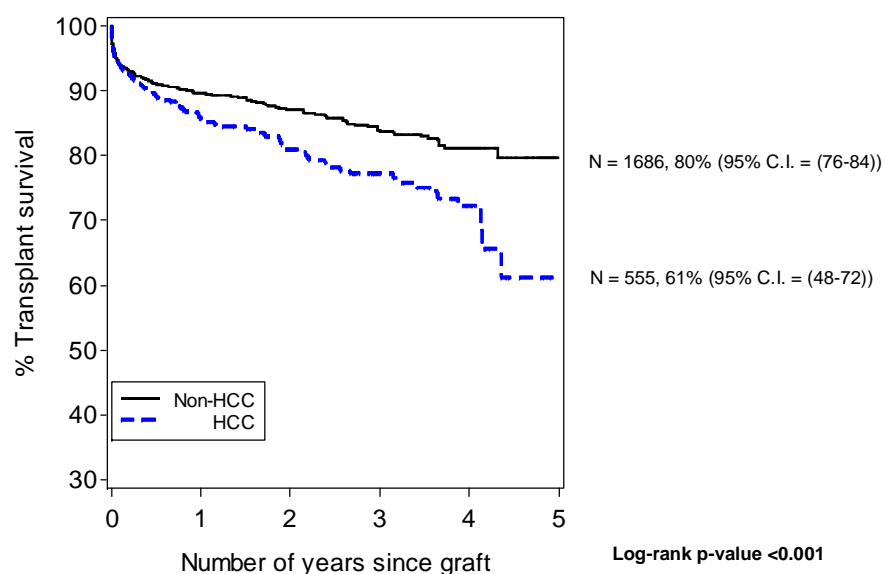
- 8 **Table 5** shows the median number of bed days defined as the number of days between transplant and discharge from hospital for HCC patients and non-HCC patients, where date of discharge was known.

**Table 5** Distribution of bed days for first adult elective transplants, 1 July 2008 to 31 December 2012

Group	N	Median (days)	Interquartile Range	Min	Max
Non-HCC	1558	16	11-24	1	107
HCC	518	14	11-19	1	96

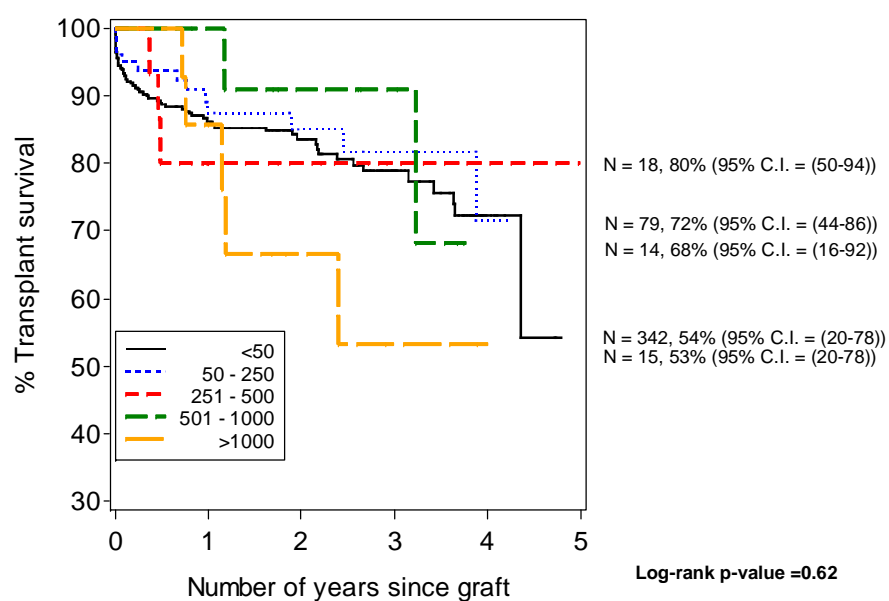
- 9 **Figure 1** shows five year transplant survival for first adult elective deceased donor liver only transplants by whether the patient had HCC recorded at transplant. Five year transplant survival for the HCC patients was 61% compared with 80% for non-HCC patients and this was statistically significant (log-rank p-value<0.001).

**Figure 1** 5-year transplant survival for HCC patients VS non-HCC, 1 July 2008 to 31 December 2012 in the UK

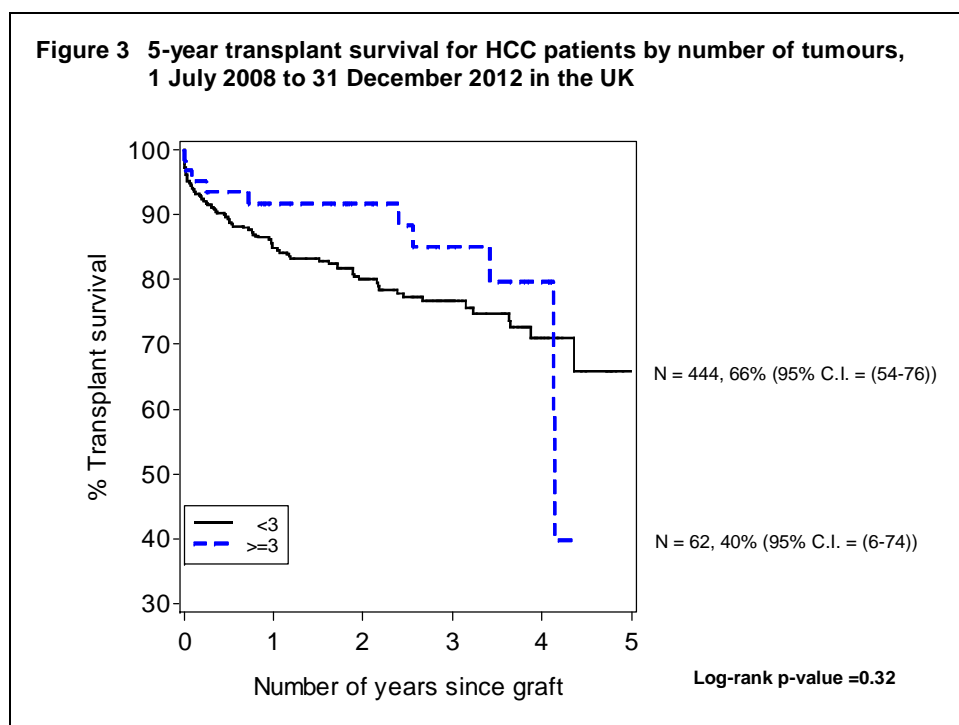


- 10 **Figure 2** shows five year transplant survival for first adult elective deceased donor liver only transplants in HCC patients by alpha-fetoprotein (AFP) level. Five year transplant survival for patients with an AFP level of less than 50 iu/ml is estimated at 54% (95% CI 20%-78%). There is no statistically significant difference between the groups.

**Figure 2** 5-year transplant survival for HCC patients by AFP level, 1 July 2008 to 31 December 2012 in the UK



- 11 **Figure 3** shows five year transplant survival by the number of tumours. Those with less than three tumours had a higher transplant survival rate than those with three or more tumours, 66% (95% CI 54%-76%) compared with 40% (95% CI 6%-74%), respectively, although this was not statistically significant.



- 12 **Table 6** shows the median waiting time to transplant for first adult elective liver registrations with HCC between 1 January 2010 and 31 December 2012 by AFP level. Those patients with a maximum AFP level of greater than 1000 iu/ml have the longest median waiting time of 188 days, followed by those with an AFP level of less than 50 iu/ml with 143 days. Those with an AFP level of between 501 and 1000 iu/ml have the shortest median waiting time, 62 days. These results must be interpreted with caution due to the small numbers in some of the groups.

**Table 6** Median waiting time to transplant for first adult elective registrations with HCC, 1 January 2010 to 31 December 2012, by AFP level

AFP level (iu/ml)	N	Median (days)	95% CI
<50	387	143	122-164
50-250	71	94	49-139
251-500	20	91	0-191
501-1000	12	62	8-116
>1000	19	188	116-260

**ACTION**

- 13 The Liver Selection and Allocation Working Party recommend lowering the level of AFP, at which it is an absolute contraindication to transplant, from 10,000 to 1,000 iu/ml.

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**October 2013**