

CHAPTER 10

Hepatitis on Dialysis

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Table 10.1: Prevalence of positive HBsAg and positive Anti-HCV at annual survey, HD patients 1997-2006

Year	No. of subjects	Prevalence of HBsAg+ (%)	Prevalence of Anti-HCV+ (%)
1997	1694	6	23
1998	2139	6	22
1999	2991	6	23
2000	4386	6	25
2001	5187	6	23
2002	6106	5	20
2003	6977	5	19
2004	7618	5	17
2005	8957	4	14
2006	11116	5	12

Table 10.2: Prevalence of positive HBsAg and positive Anti-HCV at annual survey, CAPD patients 1997-2006

Year	No. of subjects	Prevalence of HBsAg+ (%)	Prevalence of Anti-HCV+ (%)
1997	476	3	5
1998	541	3	6
1999	610	2	5
2000	662	2	5
2001	781	2	3
2002	891	3	4
2003	1223	3	4
2004	1200	4	5
2005	1318	4	5
2006	1489	5	4

The prevalence of Hepatitis B infection has remained low and was similar when comparing HD and CAPD patients whereas prevalence of HCV was still higher in HD than CAPD patients as a result of the higher risk of nosocomial transmission with HD. However with effective and more stringent implementation of infection control measures, HCV prevalence has continued to decline by 2-3% annually from 2001 onwards.

There was only small center variation in the proportion of hepatitis B positive patients in both HD and CAPD.

Table 10.3: Variation in Proportion of patients with positive HBsAg at annual survey among HD centres, 2006

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
1997	44	0	0	2.5	5	9	17	19
1998	50	0	0	0	5	9	18	23
1999	76	0	0	0	4	9.5	19	30
2000	109	0	0	0	4	8	15	80
2001	125	0	0	0	5	9	15	90
2002	156	0	0	0	3	8	14	27
2003	178	0	0	0	3.5	8	15	64
2004	198	0	0	0	3	8	15	100
2005	231	0	0	0	1	6	15	100
2006	283	0	0	0	0	6	16	94

Figure 10.3: Variation in Proportion of patients with positive HBsAg among HD centres, 2006

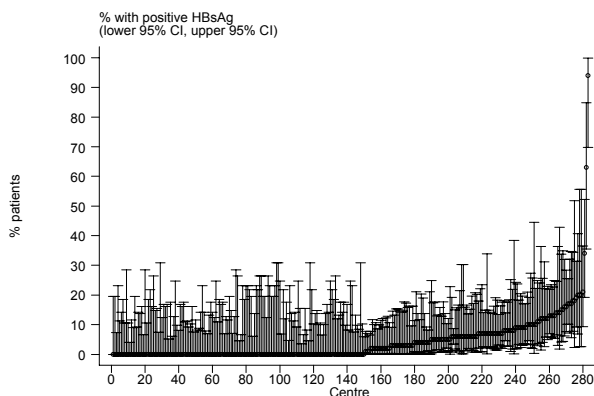


Table 10.4: Variation in Proportion of patients with positive HBsAg at annual survey among CAPD centres, 2006

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
1997	7	0	0	0	2	3	8	8
1998	9	0	0	0	1	3	6	6
1999	10	0	0	0	2	2	4	4
2000	11	0	0	0	1	4	5	5
2001	12	0	0	0	2	3	9	9
2002	15	0	0	1	3	6	18	18
2003	19	0	0	1	3	6	8	8
2004	19	0	0	1	3	6	11	11
2005	21	0	0	0	3	5	5	11
2006	23	0	0	0	4	6	9	13

Figure 10.4: Variation in Proportion of patients with positive HBsAg among CAPD centres, 2006

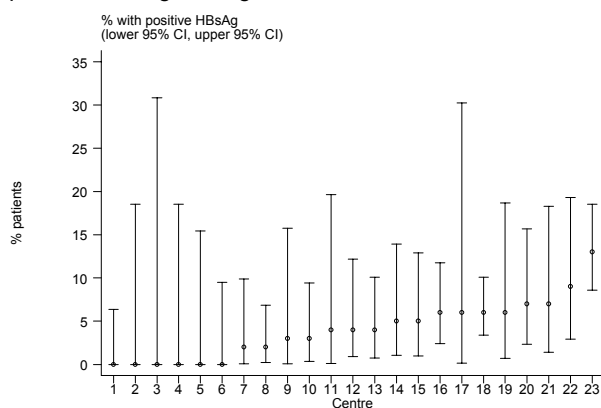
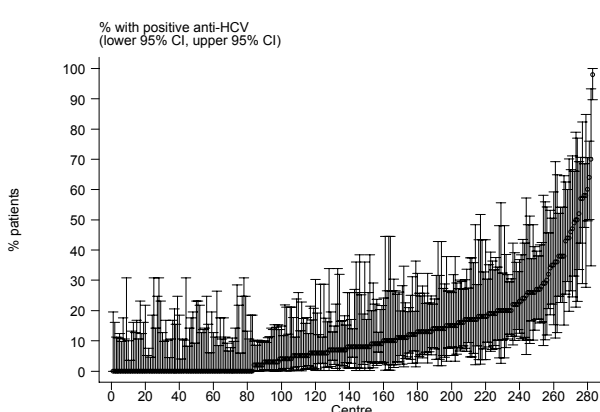


Figure 10.5: Variation in Proportion of patients with positive anti-HCV among HD centres, 2006



Even though the median proportion of HCV infected HD patients continued to decline annually from 21% in 1997 to 8% in 2006, there was still wide center variation (table and figure 10.5). This probably reflected the differences in infection control practices and criteria for intake of patients among centers.

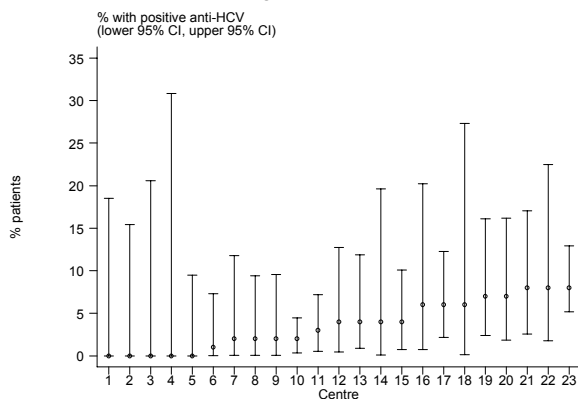
Table 10.5: Variation in Proportion of patients with positive anti-HCV at annual survey among HD centres, 2006

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
1997	44	0	0	14.5	21	29	47	63
1998	50	0	0	9	19.5	30	61	79
1999	76	0	0	7	19.5	32.5	60	79
2000	109	0	0	9	18	30	70	91
2001	125	0	0	7	17	30	64	91
2002	156	0	0	5	14	24.5	51	96
2003	178	0	0	5	13	24	50	96
2004	201	0	0	4	11	24	50	100
2005	232	0	0	0	9.5	19	44	98
2006	283	0	0	0	8	17	44	98

Table 10.6: Variation in Proportion of patients with positive anti-HCV at annual survey among CAPD centres, 2006

Year	No. of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
1997	7	0	0	0	6	7	9	9
1998	9	0	0	3	3	8	11	11
1999	10	0	0	3	4	7	14	14
2000	11	0	0	2	3	8	10	10
2001	12	0	0	0	3	4.5	7	7
2002	15	0	0	0	3	8	12	12
2003	19	0	0	1	4	7	9	9
2004	19	0	0	0	4	7	10	10
2005	21	0	0	1	4	8	10	11
2006	23	0	0	1	4	6	8	8

Figure 10.6: Variation in Proportion of patients with positive anti-HCV among CAPD centres, 2006



Similar to Hepatitis B infection, the prevalence of HCV infection was low in CAPD patients and did not vary greatly between centers.

Table 10.7a: Risk factors in relation to HD practices for seroconversion to anti-HCV positive among sero-negative patients

Risk factor	Number of patients	Risk Ratio	95% CI	p-value
Assistance to Perform HD				
(1) Self care ^{ref}	151	1.000		
(2) Partial self care	108	0.701	(0.542 0.908)	0.007
(3) Completely assisted	239	0.469	(0.377 0.583)	0.000
Dialyzer Reuse				
(1) less than 10 ^{ref}	161	1.000		
(2) more than 10	362	0.733	(0.607 0.885)	0.001
Dialyzer Reprocessing System				
(1) Fully Auto ^{ref}	275	1.000		
(2) Semi Auto	29	0.702	(0.478 1.030)	0.070
(3) Manual	29	0.710	(0.484 1.042)	0.081
(4) No Reuse	0	0.000		
Age				
(1) <=20 ^{ref}	29	1.000		
(2) 21-40	189	0.914	(0.619 1.432)	0.778
(3) 41-60	242	0.538	(0.356 0.813)	0.003
(4) >60	63	0.243	(0.154 0.385)	0.000
Gender				
(1)Female ^{ref}	213	1.000		
(2)Male	310	1.168	(0.977 1.395)	0.088
Diabetes				
(1)No ^{ref}	420	1.000		
(2)Yes	103	0.330	(0.267 0.408)	0.000
Previous Renal Transplant				
(1)No ^{ref}	474	1.000		
(2)Yes	49	3.357	(2.426 4.645)	0.000
History of Blood Transfusion				
(1)No ^{ref}	319	1.000		
(2)Yes	204	1.287	(1.075 1.540)	0.006

Risk factors associated with occurrence of HCV seroconversion can be divided into patient-level factors and center-level factors. Patient-level factors such as previous renal transplant and history of blood transfusion were associated with a significantly higher risk of HCV seroconversion. There was also a trend of increasing risk with men and younger patients and lower risk with diabetes.

Completely assisted HD patients had a significantly lower risk of acquiring HCV infection. This was not surprising as these patients were fully assisted by trained HD staffs who were more stringent with infection control measures. However a rather interesting finding was that center-level factors such as increased frequency of dialyser reuse, the use of semi-automated and manual reprocessing systems seemed to be associated with lower risk of acquiring HCV infection. As the number of study patients was small, it is possible that these factors did not actually influence HCV seroconversion, but rather reflected differences in practices among centers. Total segregation and good practice of universal precautions are probably more important contributing factors.

Table 10.7b: Risk factors for seroconversion to anti-HCV positive among sero-negative patients in CAPD

Risk factor	Number of patients	Risk Ratio	95% CI	p-value
Age				
(1) <=20 ^{ref}	4			
(2) 21-40	8	1.553	(0.474 5.095)	0.467
(3) 41-60	8	0.713	(0.213 2.387)	0.583
(4) >60	2	0.338	(0.062 1.859)	0.213
Gender				
(1)Female ^{ref}	9			
(2)Male	13	1.384	(0.604 3.171)	0.323
Diabetes				
(1)No ^{ref}	18			
(2)Yes	4	0.334	(0.113 0.986)	0.047
Switched from HD to CAPD				
(1)No ^{ref}	18			
(2)Yes	4	2.215	(0.744 6.591)	0.153
Previous Renal Transplant				
(1)No ^{ref}	22			
(2)Yes	1	1.144	(0.152 8.610)	0.896
History of Blood Transfusion				
(1)No ^{ref}	11			
(2)Yes	12	2.191	(0.961 4.994)	0.062

CAPD patients who were switched from HD, had previous renal transplant and blood transfusion had a tendency for increased risk of seroconversion, but these findings did not reach statistical significance as the number of study patients was small.

Conclusion:

Nosocomial transmission in HD has been implicated for the higher HCV prevalence in HD compared to CAPD. Our efforts to curb the epidemic of hepatitis in HD has been shown to be effective with the decreasing prevalence of HCV annually. However there should be further investigations into the mechanism of transmission and aspects of our current HD practices which may put patients at risk of HCV infection.