CHAPTER 11

Hepatitis on Dialysis

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The prevalence of Hepatitis B infection has remained low and was similar comparing HD and CAPD patients. Due to the higher risk of nosocomial transmission with HD, HCV prevalence remains higher in HD as compared to CAPD patients. However an annual decline in HCV prevalence is observed and this implies that the current infection control measures to curb the epidemic of HCV within our dialysis facility has been successful.

Table 11.1: Prevalence of positive HBsAg and positive Anti-HCV at annual survey, HD patients 1998-2007

Year	No. of subjects	Prevalence of HBsAg$^+$ (%)	Prevalence of Anti-HCV$^+$ (%)
1998	2139	6	22
1999	2991	6	23
2000	4386	6	25
2001	5187	6	23
2002	6106	5	20
2003	6976	5	19
2004	7617	5	17
2005	8957	4	14
2006	11295	5	12
2007	12479	5	11

Table 11.2: Prevalence of positive HBsAg and positive Anti-HCV at annual survey, CAPD patients 1998-2007

Year	No. of subjects	Prevalence of HBsAg$^+$ (%)	Prevalence of Anti-HCV$^+$ (%)
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	1491	5	4
2007	1727	5	4

Table 11.3: Variation in Proportion of patients with positive HBsAg at annual survey among HD centres, 2007

Year	No. of centres	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
1998	50	0	0	0	5	9	18	23
1999	75	0	0	0	5	10	19	30
2000	108	0	0	0	4	9	15	73
2001	125	0	0	0	5	9	15	82
2002	157	0	0	0	3	8	14	80
2003	180	0	0	0	3.5	7	15	69
2004	203	0	0	0	3	8	14	93
2005	233	0	0	0	1	6	15	100
2006	291	0	0	0	0	6	15	94
2007	305	0	0	0	0	6	16	100

Figure 11.3: Variation in Proportion of patients with positive HBsAg among HD centres, 2007

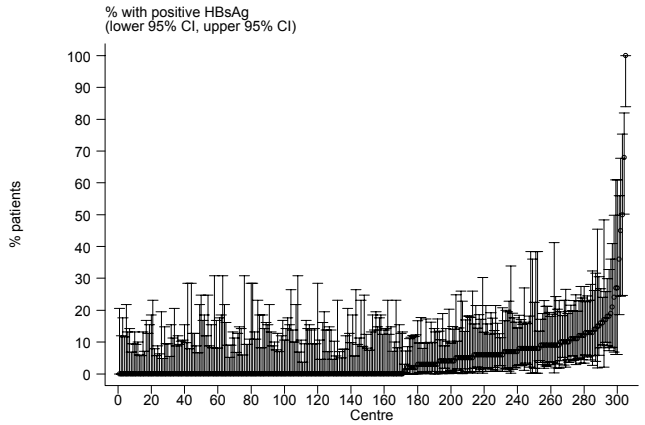


Table 11.4: Variation in Proportion of patients with positive HBsAg at annual survey among CAPD centres, 2007

Year	No. of centres	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
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	5	11	11
2005	20	0	0	0.5	3	5	7.5	10
2006	22	0	0	2	4	6	9	13
2007	23	0	0	0	4	6	7	11

Figure 11.4: Variation in Proportion of patients with positive HBsAg among CAPD centres, 2007

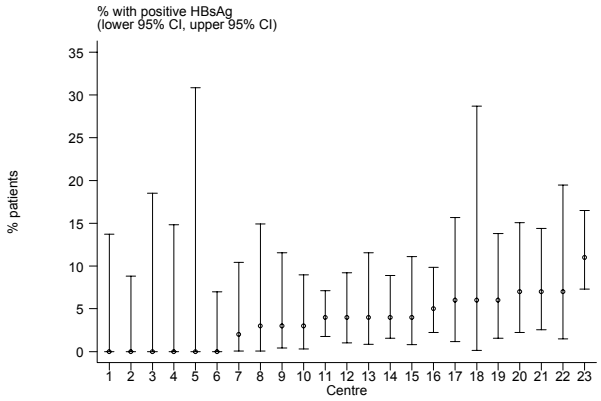
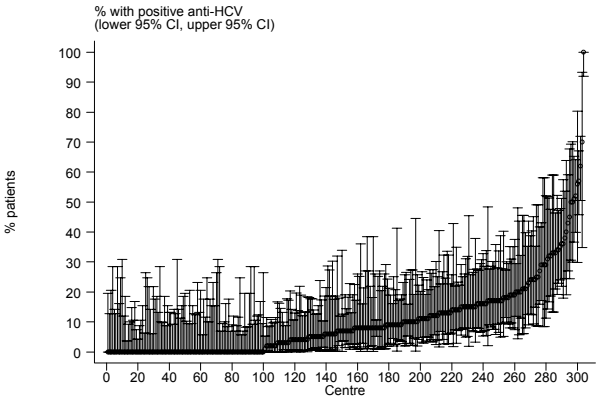


Figure 11.5: Variation in Proportion of patients with positive anti-HCV among HD centres, 2007



There is only small center to center variation in the proportion of Hepatitis B patients for both HD and CAPD.

The median proportion of HCV infected HD patients continue to decline annually even though there remains a wide center to center variation in the prevalence of HCV infection. There should be continuing measures to implement and standardize strict infection control measures in the HD facility in order to reduce this center to center variation.

Table 11.5: Variation in Proportion of patients with positive anti-HCV at annual survey among HD centres, 2007

Year	No. of centre	Min	5th centile	LQ	Median	UQ	95th centile	Max
1998	50	0	0	9	20.5	30	61	78
1999	75	0	0	7	20	33	62	79
2000	108	0	0	8.5	18.5	30.5	70	91
2001	125	0	0	7	17	30	64	91
2002	157	0	0	5	14	25	58	96
2003	180	0	0	5.5	14	25.5	49.5	96
2004	205	0	0	4	11	25	49	100
2005	234	0	0	2	10	21	40	98
2006	291	0	0	0	8	18	45	98
2007	304	0	0	0	7	15	35	100

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

Table 11.6: Variation in Proportion of patients with positive anti-HCV at annual survey among CAPD centres, 2007

Year	No. of centre	Min	5th centile	LQ	Median	UQ	95th centile	Max
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	7	7
2002	15	0	0	0	3	8	11	11
2003	19	0	0	1	4	8	9	9
2004	19	0	0	0	4	7	10	10
2005	20	0	0	2	4	7.5	9.5	10
2006	22	0	0	2	4	6	8	9
2007	23	0	0	1	3	6	8	9

Figure 11.6: Variation in Proportion of patients with positive anti-HCV among CAPD centres, 2007

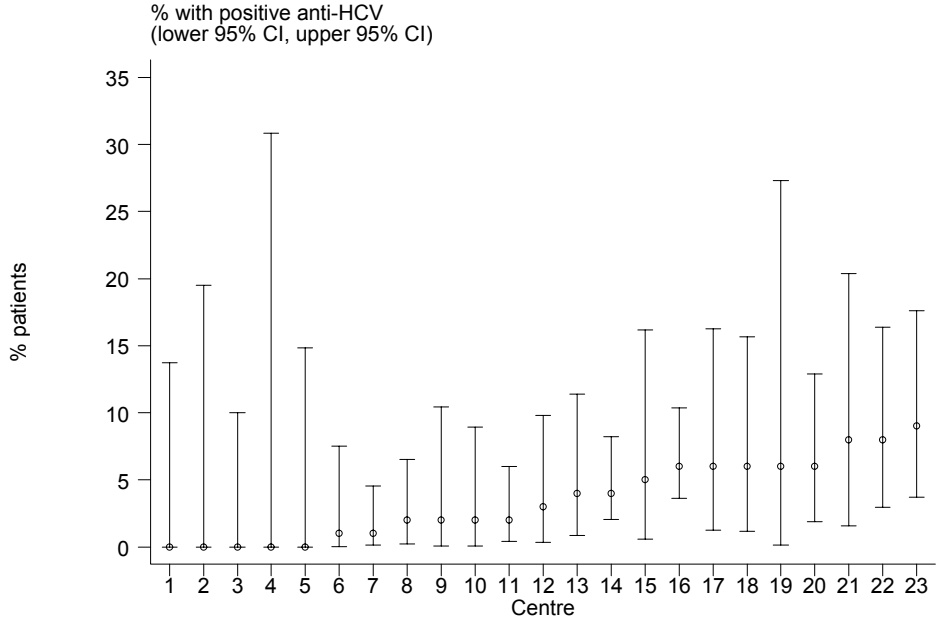


Table 11.7(a): Risk factors in relation to HD practices for seroconversion to anti-HCV positive among sero-negative patients

Risk factor	Number of patients	Risk Ratio	95% CI	p-value
Assistance to Perform HD				
(1) Self care [ref]	158	1.00		
(2) Partial self care	128	0.66	(0.52, 0.84)	0.001
(3) Completely assisted	311	0.43	(0.36, 0.53)	0.000
Dialyzer Reuse				
(1) less than 10 [ref]	260	1.00		
(2) more than 10	350	0.96	(0.82, 1.13)	0.654
Dialyzer Reprosessing System				
(1) Fully Auto [ref]	306	1.00		
(2) Semi Auto	25	1.29	(0.85, 1.95)	0.235
(3) Manual	45	1.01	(0.74, 1.39)	0.938
(4) No Reuse	1	2.91	(0.38, 22.45)	0.305
Age				
(1) <=20 [ref]	26	1.00		
(2) 21-40	200	1.06	(0.70, 1.61)	0.780
(3) 41-60	278	0.57	(0.38, 0.86)	0.008
(4) >60	106	0.32	(0.21, 0.49)	0.000
Gender				
(1) Female [ref]	239	1.00		
(2) Male	371	1.19	(1.01, 1.41)	0.035
Diabetes				
(1) No [ref]	444	1.00		
(2) Yes	166	0.41	(0.34,0.49)	0.000
Previous Renal Transplant				
(1) No [ref]	515	1.00		
(2) Yes	95	3.93	(3.13, 4.94)	0.000
History of Blood Transfusion				
(1) No [ref]	371	1.00		
(2) Yes	239	1.24	(1.05,1.46)	0.011

Risk factors for HCV seroconversion were previous renal transplant and a history of blood transfusion. There was also a trend of increasing risk with men and younger patients. Completely assisted HD patients and diabetics had a lower risk of acquiring HCV infection. This was not surprising as these patients are fully assisted by trained staffs who may be more stringent with infection control measures. Completely assisted patients also tend to have more co morbidities such as diabetes. This may explain why diabetics have a lower tendency to acquire HCV infection in the dialysis facility.

Table 11.7(b): 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	26	1.00		
(2) 21-40	200	2.79	(0.93, 8.33)	0.067
(3) 41-60	278	1.66	(0.57, 4.86)	0.354
(4) >60	106	0.39	(0.09, 1.74)	0.216
Gender				
(1) Female ref	239	1.00		
(2) Male	371	1.26	(0.70, 2.30)	0.441
Diabetes				
(1) No ref	444	1.00		
(2) Yes	166	0.32	(0.15, 0.66)	0.002
Switch from HD to CAPD				
(1) No ref	3,443	1.00		
(2) Yes	283	8.59	(4.67, 15.81)	0.000
Previous Renal Transplant				
(1) No ref	515	1.00		
(2) Yes	95	1.95	(0.76, 4.98)	0.164
History of Blood Transfusion				
(1) No ref	371	1.00		
(2) Yes	239	1.79	(0.99, 3.23)	0.052

CAPD patients who were switched from HD, had previous renal transplant and blood transfusion had a tendency for increased risk of seroconversion.

Conclusion:

Nosocomial transmission in HD has been implicated for the higher HCV prevalence in HD compared to CAPD. Even though our efforts to reduce the overall prevalence of HCV in HD has been successful, a wide center to center variation still remains.

Areas of future research would include aspects of our current HD practices which may account for the wide center variation in HCV prevalence. These include dialyzer reuse practices, isolation and infection control protocols and staffing level.