CHAPTER 10

HEPATITIS ON DIALYSIS

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SECTION A: PREVALENCE

Between 2001 and 2010, the annual prevalence of patients with Hepatitis B, remained low and was quite similar comparing HD and PD patients, with ranges from 4% to 6% in HD and from 2 to 5% in PD patients.

The prevalence of Hepatitis C in PD patients remains low annually, while in HD patients there continues to be an annual decline, which implies that dialysis facilities around the country have been consistent in maintaining stringent infection control measures to prevent new HCV seroconversions.

Table 10.1: Prevalence of positive HBsAg and positive Anti-HCV at annual survey, HD patients 2001-2010

Year	Number of patients	Prevalence of HBsAg+ (%)	Prevalence of Anti-HCV+ (%)
2001	5187	6	23
2002	6106	5	20
2003	6977	5	19
2004	7618	5	17
2005	8957	4	14
2006	11295	5	12
2007	12496	5	11
2008	14951	4	9
2009	17354	4	8
2010	18575	4	7

Table 10.2: Prevalence of positive HBsAg and positive Anti-HCV at annual survey, PD patients 2001-2010

Year	Number of patients	Prevalence of HBsAg+ (%)	Prevalence of Anti-HCV+ (%)
2001	781	2	3
2002	891	3	4
2003	1223	3	4
2004	1200	4	5
2005	1318	4	5
2006	1494	5	4
2007	1731	5	4
2008	2017	4	3
2009	2144	4	3
2010	2280	3	3

SECTION B: CENTRE VARIATION

There was larger center to center variation among HD compared to PD centers in terms of the proportion of Hepatitis B patients. Some smaller HD centers may practice the policy of not accepting Hepatitis B patients and therefore Hepatitis B patients tend to be segregated to the larger and older HD centers.

The variation in prevalence of HCV patients among the HD centers was even wider compared to Hepatitis B. This reflects the diversities in infection control protocols among centers. There should be regular audits to ensure standardization and consistent implementation of stringent infection control protocols to further reduce the incidence of new HCV seroconversions.

Table 10.3: Variation in Proportion of patients with positive HBsAg at annual survey among HD centres, 2001-2010

Year	Number of centres	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2001	127	0	0	0	5	9	16	90
2002	153	0	0	0	3	8	14	26
2003	184	0	0	0	3	8	15	73
2004	208	0	0	0	3	7	15	92
2005	237	0	0	0	2	6	16	100
2006	289	0	0	0	0	6	16	94
2007	316	0	0	0	0	6	15	100
2008	364	0	0	0	0	6	12	100
2009	400	0	0	0	0	5	13	96
2010	428	0	0	0	0	5.5	13	100

Table 10.4: Variation in Proportion of patients with positive HBsAg at annual survey among PD centres, 2001-2010

Year	Number of centres	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2001	12	0	0	0	2	3	9	9
2002	15	0	0	1	3	6	18	18
2003	18	0	0	2	4	6	8	8
2004	18	0	0	1	3	5	11	11
2005	19	0	0	1	3	5	10	10
2006	22	0	0	2	4	6	9	13
2007	22	0	0	2	4	6	8	11
2008	23	0	0	1	4	5	10	13
2009	23	0	0	1	4	5	9	10
2010	24	0	0	1	3	4	5	7

Figure 10.3: Variation in Proportion of patients with positive HBsAg among HD centres, 2010

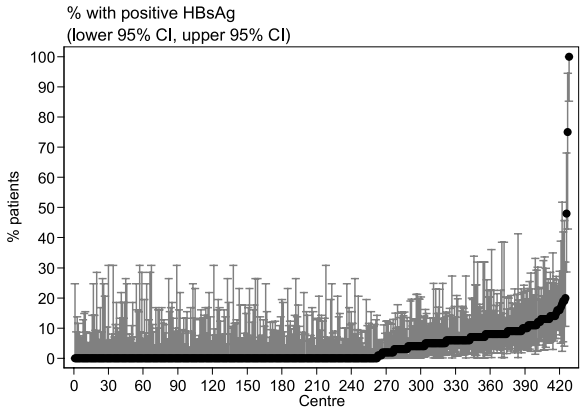


Figure 10.4: Variation in Proportion of patients with positive HBsAg among PD centres, 2010

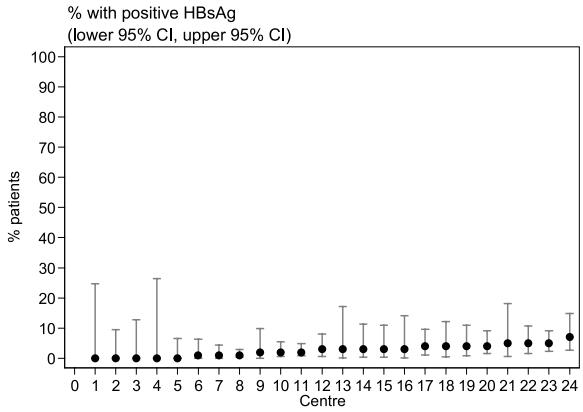


Table 10.5: Variation in Proportion of patients with positive anti-HCV at annual survey among HD centres, 2001-2010

Year	Number of centre	Min	5th centile	LQ	Median	UQ	95th centile	Max
2001	127	0	0	5	17	31	65	88
2002	153	0	0	5	14	26	54	94
2003	184	0	0	6	13	25	50	90
2004	210	0	0	4	11.5	25	50	100
2005	239	0	0	0	10	20	38	98
2006	288	0	0	0	8	17.5	41	98
2007	315	0	0	0	7	14	35	100
2008	364	0	0	0	5	12	29	100
2009	400	0	0	0	3	10	26	98
2010	427	0	0	0	2	9	24	98

Table 10.6: Variation in Proportion of patients with positive anti-HCV at annual survey among PD centres, 2001-2010

Year	Number of centre	Min	5th centile	LQ	Median	UQ	95th centile	Max
2001	12	0	0	0	3	4	7	7
2002	15	0	0	0	3	8	11	11
2003	18	0	0	1	4.5	7	9	9
2004	18	0	0	1	4.5	7	10	10
2005	19	0	0	2	4	8	11	11
2006	22	0	0	1	2.5	6	8	11
2007	22	0	0	1	2.5	6	8	9
2008	23	0	0	0	3	4	5	9
2009	23	0	0	0	2	3	5	8
2010	24	0	0	0.5	2	3	5	5

Figure 10.5: Variation in Proportion of patients with positive anti-HCV among HD centres, 2010

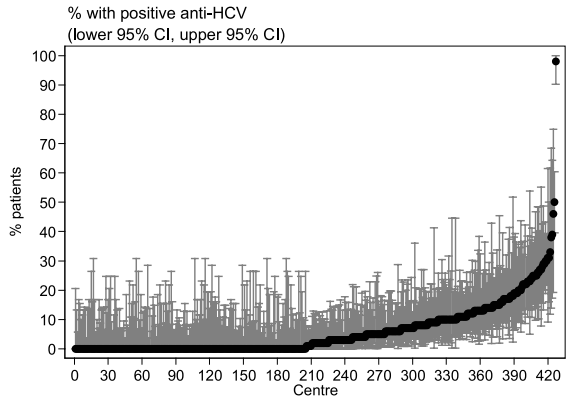
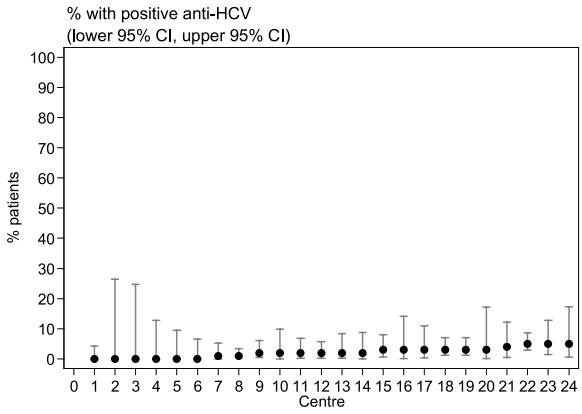


Figure 10.6: Variation in Proportion of patients with positive anti-HCV among PD centres, 2010



SECTION C: SEROCONVERSION RISKS

As shown in Table 10.7 (a) and Figure 10.7 (b), the cumulative risk of HBV infection was 2.17% at 7 years on PD and 1.18% for HD. The risks were low, and appeared to be slightly higher in patients on PD. This could be due to the much smaller PD population compare to the HD population. Another contributing factor could be that patients undergoing HD were more likely to get vaccinated against Hepatitis B as compared to patients undergoing PD. There should be a standard practice that all predialysis patients get Hepatitis B vaccination before starting dialysis regardless of dialysis modality.

The cumulative risk of HCV infection was 2.01% at 7 years on PD and is only slightly higher at 3.16% for HD. The risk of HCV seroconversion on HD has decreased markedly as compared to the 2003 NRR report where the risk of HCV infection on HD was 15% at 5 years. [1].

Table 10.7 (a) Cumulative risk of sero-conversion to HBsAg positive among sero-negative patients at entry into dialysis, comparing HD and CAPD 2001-2010

Modality	CAPD		HD	
Interval (years)	% Cumulative probability	SE*	% Cumulative probability	SE*
1	0.65	0.19	0.35	0.10
2	1.26	0.18	0.76	0.12
3	1.53	0.08	0.96	0.06
4	1.83	0.09	1.09	0.04
5	1.96	0.04	1.18	0.03
6	2.12	0.05	1.26	0.02
7	2.17	0.02	1.31	0.02
8	-	-	1.35	0.01
9	-	-	1.37	0.01
10	-	-	1.38	0.00

Figure 10.7 (a) Cumulative risk of sero-conversion to HBsAg positive among sero-negative patients at entry into dialysis, comparing HD and CAPD 2001-2010

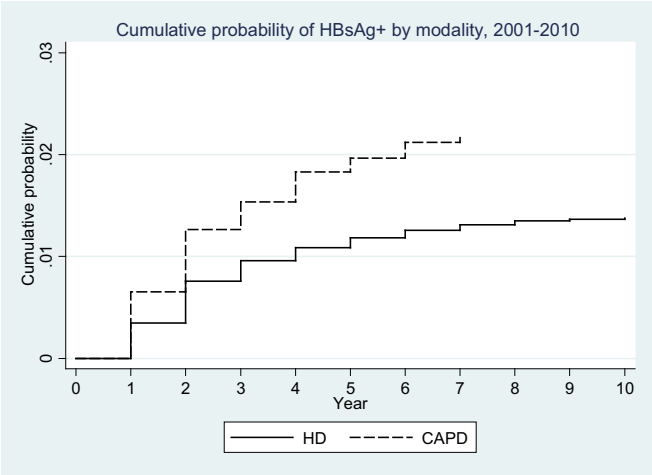
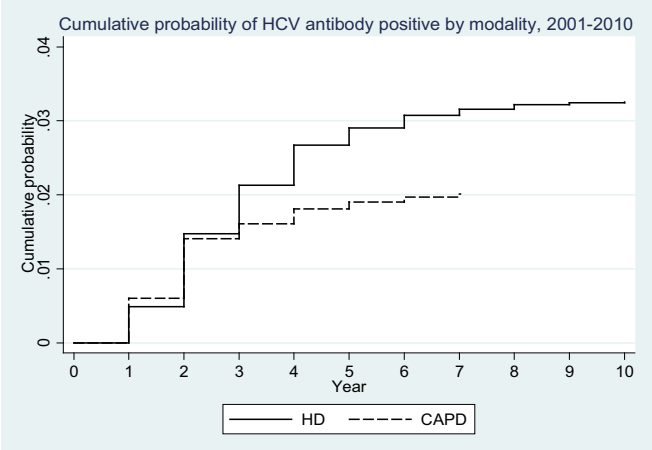


Table 10.7 (b) Cumulative risk of sero-conversion to anti HCV antibody positive among sero-negative patients at entry into dialysis, comparing HD and CAPD 2001-2010

Modality	CAPD		HD	
Interval (years)	% Cumulative probability	SE*	% Cumulative probability	SE*
1	0.60	0.18	0.49	0.14
2	1.41	0.24	1.47	0.28
3	1.61	0.06	2.13	0.19
4	1.81	0.06	2.67	0.16
5	1.90	0.03	2.90	0.07
6	1.97	0.02	3.07	0.05
7	2.01	0.02	3.16	0.02
8	-	-	3.22	0.02
9	-	-	3.24	0.01
10	-	-	3.26	0.00

Figure 10.7 (b) Cumulative risk of sero-conversion to anti HCV antibody positive among sero-negative patients at entry into dialysis, comparing HD and CAPD 2001-2010



Tables 10.8 (a) and 10.8 (b) looked at the risk for HCV seroconversion in relation to patient characteristics or HD practices. Higher seroconversion risks were seen in PD patients who switched modality from HD, while in HD, patients at higher risks were those who had previous renal transplant and history of blood transfusion. In terms of patient demographics, there was a trend for increased risk among men and older age groups.

In terms of HD practices, centers which still use the manual dialyzer reprocessing systems run significantly higher risk of seroconversion. However a significantly lower seroconversion risk was seen with dialyzer reuse of > 10 times. This may be due to the fact that most centers which practice dialyzer reuse of > 10 times are probably also using fully automated reprocessing systems.

Table 10.8 (a): Risk factors in relation to HD practices for seroconversion to anti-HCV positive among sero-negative patients 2001-2010

Risk factor	Number of patients	Risk Ratio	95% CI	p-value
Assistance to Perform HD				
• Self care(ref*)	119	1.00		
• Partial self care	95	0.82	(0.62;1.09)	0.165
• Completely assisted	643	0.96	(0.78;1.19)	0.718
Dialyzer Reuse				
• less than 10 (ref*)	490	1.00		
• more than 10	362	0.51	(0.44;0.59)	<0.001
Dialyzer Reprosessing System				
• Fully Auto (ref*)	545	1.00		
• Semi Auto	98	1.22	(0.99;1.52)	0.067
• Manual	80	1.58	(1.25;2)	<0.001
Age				
• <=20 (ref*)	7	1.00		
• 21-40	91	1.41	(0.62;3.19)	0.414
• 41-60	370	1.57	(0.7;3.52)	0.269
• >60	392	1.74	(0.78;3.9)	0.179
Gender				
• Female (ref*)	350	1.00		
• Male	510	1.17	(1.01;1.36)	0.032
Diabetes				
• No (ref*)	407	1.00		
• Yes	453	0.83	(0.72;0.97)	0.018
Previous Renal Transplant				
• No (ref*)	834	1.00		
• Yes	26	2.08	(1.39;3.11)	<0.001
History of Blood Transfusion				
• No (ref*)	501	1.00		
• Yes	359	1.37	(1.18;1.58)	<0.001

Table 10.8 (b): Risk factors for seroconversion to anti-HCV positive among sero-negative patients in PD 2001-2010

Risk factor	Number of patients	Risk Ratio	95% CI	p-value
Age				
• <=20 (ref*)	7	1.00		
• 21-40	18	1.36	(0.57;3.23)	0.489
• 41-60	43	1.51	(0.67;3.42)	0.318
• >60	23	0.86	(0.36;2.07)	0.744
Gender				
• Female (ref*)	35	1.00		
• Male	56	1.69	(1.11;2.57)	0.015
Diabetes				
• No (ref*)	60	1.00		
• Yes	31	0.63	(0.4;1.01)	0.056
Switch from HD to PD				
• No (ref*)	67	1.00		
• Yes	24	2.25	(1.4;3.6)	0.001
Previous Renal Transplant				
• No (ref*)	90	1.00		
• Yes	1	0.27	(0.04;1.92)	0.190
History of Blood Transfusion				
• No (ref*)	48	1.00		
• Yes	43	1.34	(0.88;2.04)	0.170

Conclusion

Nosocomial transmission in HD remains the most common cause of the higher HCV prevalence in HD compared to PD. However, there has been significant improvement over the years with the consistent decline in annual prevalence of HCV and the lower cumulative risk of seroconversion in HD. We need to continue with our efforts to reduce the epidemic of hepatitis in dialysis patients with continuous surveillance, early reporting and standardization of strict infection control protocol among HD facilities nationwide.

Reference

1. Chapter 11: Hepatitis on Dialysis. 11th Report of the Malaysian Dialysis and Transplant Registry 2003. Edited by T.O Lim, Y.N Lim.