CHAPTER - 10

HEPATITIS ON DIALYSIS

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SECTION A: PREVALENCE

In both HD and PD, the annual prevalence of Hepatitis B remains low, whereas the annual prevalence of Hepatitis C is higher among HD patients compared to PD. However we continue to see a yearly decline in the prevalence of Hepatitis C in HD with only 5% prevalence last year. This implies adequate infection control measures which has effectively reduced the risk of nosocomial transmission of HCV in the haemodialysis facility.

Table 10.1: Prevalence of positive HBsAg and positive Anti-HCV at annual survey, HD patients 1993-2012

Year	Number of patients	Prevalence of HBsAg+ (%)	Prevalence of Anti-HCV+ (%)
1997	1694	6	23
1998	2139	6	22
1999	2991	6	23
2000	4384	6	25
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	17353	4	8
2010	18829	4	7
2011	22107	4	6
2012	25239	4	5

Table 10.2: Prevalence of positive HBsAg and positive Anti-HCV at annual survey, PD patients 1993-2012

Year	Number of patients	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	1494	5	4
2007	1731	5	4
2008	2017	4	3
2009	2144	4	3
2010	2280	3	3
2011	2521	3	3
2012	2853	3	2

SECTION B: CENTER VARIATION

There was a larger center to center variation in the proportion of Hepatitis B patients among HD compared to PD centers. This variation may be due to segregation of Hepatitis B patients in larger and older centers as smaller and newer centers may practice the policy of not accepting Hepatitis B patients. More than 50 % of the HD centres do not have Hepatitis B patients.

Similarly for Hepatitis C, a wide center variation existed among HD as compared to PD centers. This may reflect patient acceptance policy of the various centres as well as diversities in infection control protocols among HD centres.

Table 10.3: Variation in Proportion of patients with positive HBsAg at annual survey among HD centres, 1993-2012

Year	Number of centres	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
1997	45	0	0	3	6	9	17	20
1998	50	0	0	0	5	9	19	23
1999	74	0	0	0	4.5	10	19	30
2000	105	0	0	0	4	9	16	82
2001	127	0	0	0	5	9	17	91
2002	152	0	0	0	3	8	14	28
2003	182	0	0	0	3.5	8	17	73
2004	211	0	0	0	3	8	15	92
2005	239	0	0	0	2	7	17	100
2006	289	0	0	0	1	6	16	94
2007	321	0	0	0	0	7	15	100
2008	370	0	0	0	0	6	12	100
2009	415	0	0	0	0	5	13	96
2010	451	0	0	0	0	5	12	100
2011	509	0	0	0	0	4	12	100
2012	561	0	0	0	0	4	12	100

Figure 10.3: Variation in proportion of patients with positive HBsAg among HD centres, 2012

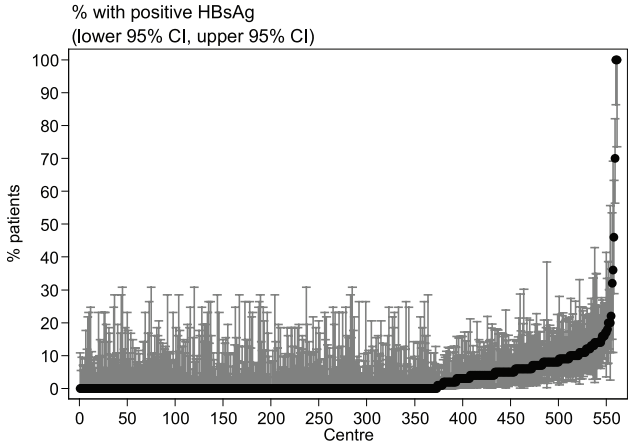

Figure 10.4: Variation in proportion of patients with positive HBsAg among PD centres, 2012

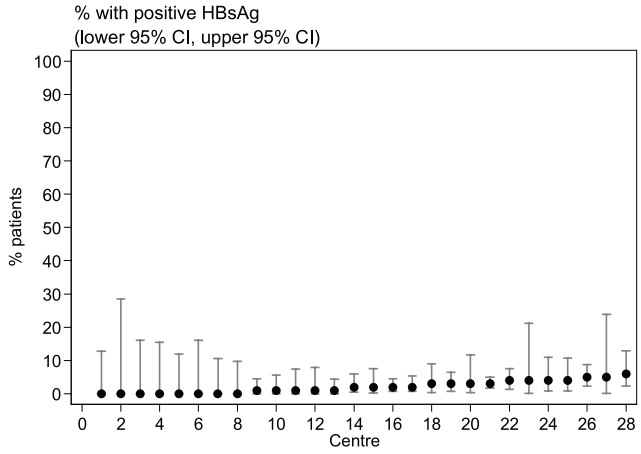

Table 10.4: Variation in proportion of patients with positive HBsAg at annual survey among PD centres, 1993-2012

Year	Number of centres	Min	5th Centile	LQ	Median	UQ	95th 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	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	0	4	6	8	11
2008	24	0	0	0.5	3	5	10	13
2009	25	0	0	0	3	5	9	10
2010	25	0	0	1	3	4	6	7
2011	28	0	0	0	2	4.5	6	16
2012	28	0	0	0	2	3.5	5	6

Table 10.5: Variation in proportion of patients with positive anti-HCV at annual survey among HD centres, 1993-2012

Year	Number of centre	Min	5th centile	LQ	Median	UQ	95th centile	Max
1997	45	0	0	15	21	30	57	70
1998	50	0	0	12	18.5	30	63	77
1999	74	0	0	7	20	29	57	78
2000	105	0	0	9	18	31	67	88
2001	127	0	0	5	17	31	64	88
2002	152	0	0	5	14.5	25.5	54	94
2003	182	0	0	6	13	24	48	90
2004	214	0	0	4	12	25	50	100
2005	241	0	0	0	10	21	40	98
2006	287	0	0	0	8	18	41	98
2007	320	0	0	0	7	15	35.5	100
2008	370	0	0	0	4.5	13	31	100
2009	415	0	0	0	3	10	27	98
2010	451	0	0	0	0	9	23	98
2011	508	0	0	0	0	7	21	100
2012	560	0	0	0	0	6	19	100

Figure 10.5: Variation in proportion of patients with positive anti-HCV among HD centres, 2012

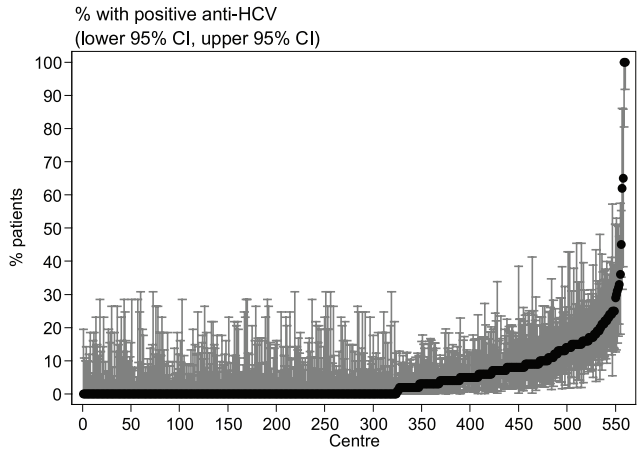

Figure 10.6: Variation in proportion of patients with positive anti-HCV among PD centres, 2012

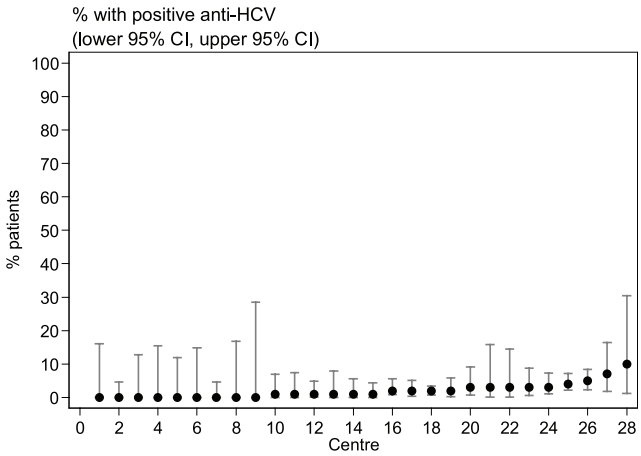

Table 10.6: Variation in proportion of patients with positive anti-HCV at annual survey among PD centres, 1993-2012

Year	Number of centre	Min	5th centile	LQ	Median	UQ	95th 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	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	2	2.5	6	8	11
2007	22	0	0	1	2.5	6	8	9
2008	24	0	0	0	4	4	6	9
2009	25	0	0	0	2	4	8	20
2010	25	0	0	0	2	3	5	20
2011	27	0	0	0	2	4	11	12
2012	28	0	0	0	1	3	7	10

SECTION C: RISK FACTORS

Table 10.7(a) looked at the risk for HCV seroconversion in relation to patient characteristics and HD practices. Higher seroconversion risks were seen in patients with previous renal transplant and a history of blood transfusion. There was a tendency for increased risk among men and older age groups. In terms of HD practices, centers which still reprocess their dialyzers manually have a significantly higher seroconversion risk.

Patients who are completely assisted by staffs have lower seroconversion risk. This may be because staffs have more training in infection control protocols as compared to the patients or their relatives. More attention should be given to the training and education of patients and their family members regarding infection control practices if they are going to perform or assist in the HD treatment. Diabetics have lower seroconversion risk probably because they tend to have more co morbidities such as impaired vision, strokes, amputations which may require total staff assistance in performing HD.

It is also interesting to note that lower seroconversion risk was seen when dialyzers were used above 7 times. This may be due to that fact that centers which practice reuse are mostly also using fully or semi automated reprocessing systems, which reduced the seroconversion risk.

Table 10.7(a): Risk factors in relation to HD practices for seroconversion to anti-HCV positive among sero-negative patients 1993-2012

Risk factor	Total Patients	Number of patients Sero converted	Risk Ratio	95% CI	p-value
Assistance to Perform HD					
Self care (ref*)	5828	342	1.00		
Partial self care	5479	322	1.18	(0.97;1.42)	0.094
Completely assisted	26240	1334	0.85	(0.72;0.99)	0.042
Dialyzer Reuse					
1 to ≤6	3747	351	1.00		
7 to ≤13	23137	856	0.46	(0.38;0.55)	<0.001
>13	8275	352	0.59	(0.49;0.72)	<0.001
Dialyzer Reprocessing System					
Fully Auto (ref*)	29113	1199	1.00		
Semi Auto	2119	132	1.23	(0.98;1.53)	0.073
Manual	1245	110	1.80	(1.42;2.28)	<0.001
Age					
<=20 (ref*)	361	11	1.00		
21-40	4231	190	1.56	(0.73;3.31)	0.248
41-60	15753	906	2.45	(1.17;5.13)	0.017
>60	17790	898	2.43	(1.16;5.1)	0.019
Gender					
Female (ref*)	16732	818	1.00		
Male	21403	1187	1.09	(0.97;1.23)	0.148
Diabetes					
No (ref*)	18365	1181	1.00		
Yes	19770	824	0.54	(0.47;0.61)	<0.001
Previous Renal Transplant					
No (ref*)	37141	1916	1.00		
Yes	994	89	2.19	(1.64;2.92)	<0.001
History of Blood Transfusion					
No (ref*)	24093	1104	1.00		
Yes	14042	901	1.65	(1.47;1.86)	<0.001

Table10. 7(b) shows the HCV seroconversion risk factors among PD patients. Those in the 21-40 age group have a tendency for increased risk compared to the older age groups, suggesting that other factors such as sexual promiscuity, recreational drug abuse may play a role. There was also higher seroconversion risk among male patients and in those who have had renal transplant in the past.

Table 10.7(b): Risk factors for seroconversion to anti-HCV positive among sero-negative patients in PD 1993-2012

Risk factor	Total Patients	Number of patients Sero converted	Risk Ratio	95% CI	p-value
Age					
<=20 (ref*)	377	10	1.00		
21-40	743	30	2.28	(1.11;4.68)	0.024
41-60	1807	53	1.75	(0.85;3.62)	0.128
>60	1785	24	0.99	(0.45;2.2)	0.988
Gender					
Female (ref*)	2358	52	1.00		
Male	2354	65	1.31	(0.91;1.88)	0.148
Diabetes					
No (ref*)	2683	77	1.00		
Yes	2029	40	0.78	(0.52;1.19)	0.247
Previous Renal Transplant					
No (ref*)	4517	107	1.00		
Yes	195	10	1.71	(0.86;3.38)	0.126
History of Blood Transfusion					
No (ref*)	3051	98	1.00		
Yes	1661	19	0.74	(0.46;1.21)	0.233

CONCLUSION

The prevalence of Hepatitis B is low and do not differ significantly between HD and PD. This is largely due to implementation of universal precautions, segregation of HBV patients and the use of HBV vaccination. However HBV vaccination should be given for all ESRD patients prior to initiation of dialysis, as predialysis patients' immune response is superior to those already on dialysis. In future, we may be able to look into our predialysis practices on early HBV vaccination and study some of the possible factors associated with poor response to vaccination.

HCV infection is more prevalent in HD compared to PD because nosocomial transmission within the HD facility play a key role. Over the years, with better implementation of infection control protocols, we have been able to reduce HCV prevalence rates in HD effectively.