CHAPTER 11

Hepatitis on Dialysis

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The prevalence of hepatitis C in HD patients continues to decline annually by 2-3%. This implies that there is greater awareness among dialysis staffs concerning the importance of stringent infection control measures in the prevention of hepatitis transmission within the dialysis facility. Prevalence of hepatitis B though low, is also declining annually. This may be due to the wider usage of hepatitis B vaccination in the dialysis and predialysis patients.

Prevalence of hepatitis B and C remains low in PD patients.

Table 11.1: Prevalence of positive HBsAg and positive Anti-HCV at annual survey, HD patients 1999-2008

Year	No. of subjects	Prevalence of HBsAg+ (%)	Prevalence of Anti-HCV+ (%)
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	11295	5	12
2007	12496	5	11
2008	14832	4	9

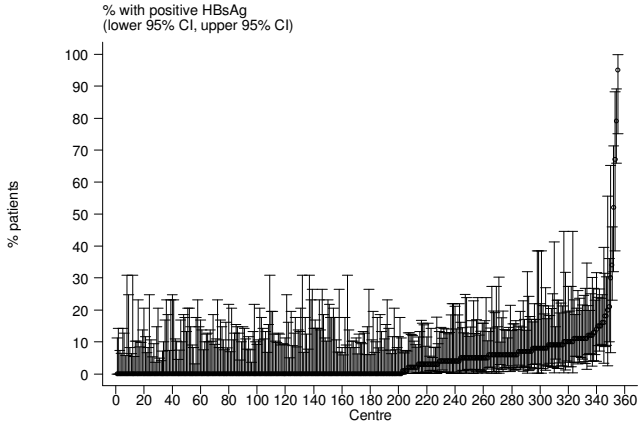
Table 11.2: Prevalence of positive HBsAg and positive Anti-HCV at annual survey, PD patients 1999-2008

Year	No. of subjects	Prevalence of HBsAg+ (%)	Prevalence of Anti-HCV+ (%)
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

Table 11.3: Variation in Proportion of patients with positive HBsAg at annual survey among HD centres, 1999-2008

Year	No. of centres	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
1999	76	0	0	0	4	10	18	30
2000	108	0	0	0	4	9	14	80
2001	127	0	0	0	5	9	16	90
2002	152	0	0	0	3	8	13	26
2003	179	0	0	0	3	8	17	67
2004	203	0	0	0	3	8	15	92
2005	235	0	0	0	2	7	15	100
2006	289	0	0	0	0	6	16	94
2007	312	0	0	0	0	6.5	15	100
2008	355	0	0	0	0	6	13	95

Figure 11.3: Variation in Proportion of patients with positive HBsAg among HD centres, 2008



In terms of the proportion of hepatitis B patients, larger center to center variation is present among HD compared to PD centers, as some smaller HD centers may practice the policy of not accepting Hepatitis B patients while larger HD centers may be the referral centers for Hepatitis B patients.

Table 11.4: Variation in Proportion of patients with positive HBsAg at annual survey among PD centres, 1999-2008

Year	No. of centres	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
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	4	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
2008	23	0	0	1	4	5	10	13

Figure 11.4: Variation in Proportion of patients with positive HBsAg among PD centres, 2008

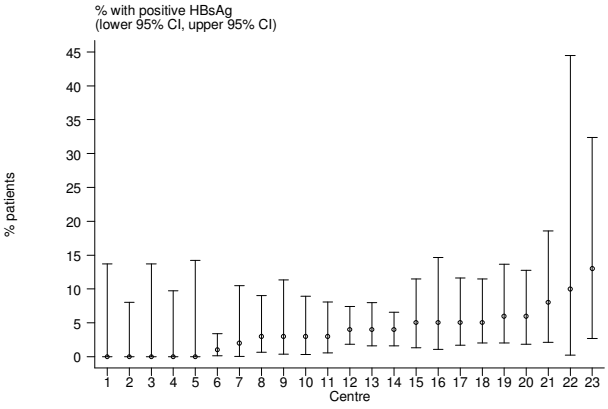


Figure 11.5: Variation in Proportion of patients with positive anti-HCV among HD centres, 2008

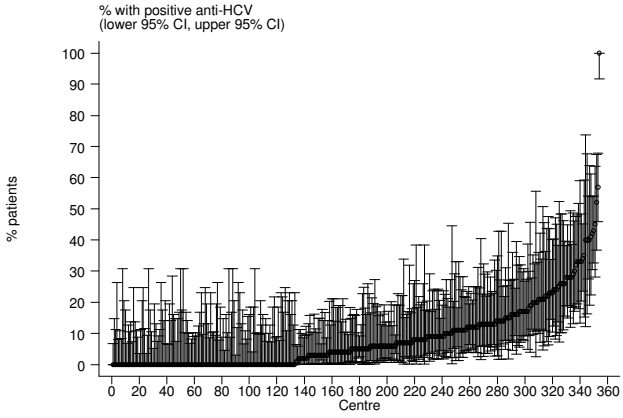


Table 11.5: Variation in Proportion of patients with positive anti-HCV at annual survey among HD centres, 1999-2008

Year	No. of centre	Min	5th cen-tile	LQ	Median	UQ	95th cen-tile	Max
1999	76	0	0	7	20	32.5	62	79
2000	108	0	0	9	19	32.5	67	87
2001	127	0	0	7	17	32	65	88
2002	152	0	0	5	14	26	54	96
2003	179	0	0	6	14	25	50	94
2004	205	0	0	4	11	25	50	100
2005	236	0	0	1	10	21	40	98
2006	289	0	0	0	8	17	43	98
2007	311	0	0	0	7	14	35	100
2008	354	0	0	0	5	12	32	100

The median proportion of HCV infected HD patients continue to decline annually even though there is still a wide center to center variation in the prevalence of HCV infection. There should be continuing measures to implement and standardize strict infection control policies in HD facilities in order to reduce this center to center variation. Regular audits should also be performed to ensure that centers adhere to these infection control policies and that the incidence of new seroconversion to hepatitis C within the HD facility does not continue to rise.

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

Table 11.6: Variation in Proportion of patients with positive anti-HCV among PD centres, 1999-2008

Year	No. of centre	Min	5th centile	LQ	Median	UQ	95th centile	Max
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	7	9	9
2004	19	0	0	0	4	7	10	10
2005	20	0	0	2	4	7.5	10	10
2006	22	0	0	1	2.5	6	8	11
2007	23	0	0	0	2	6	8	9
2008	23	0	0	0	3	4	5	9

Figure 11.6: Variation in Proportion of patients with positive anti-HCV among PD centres, 2008

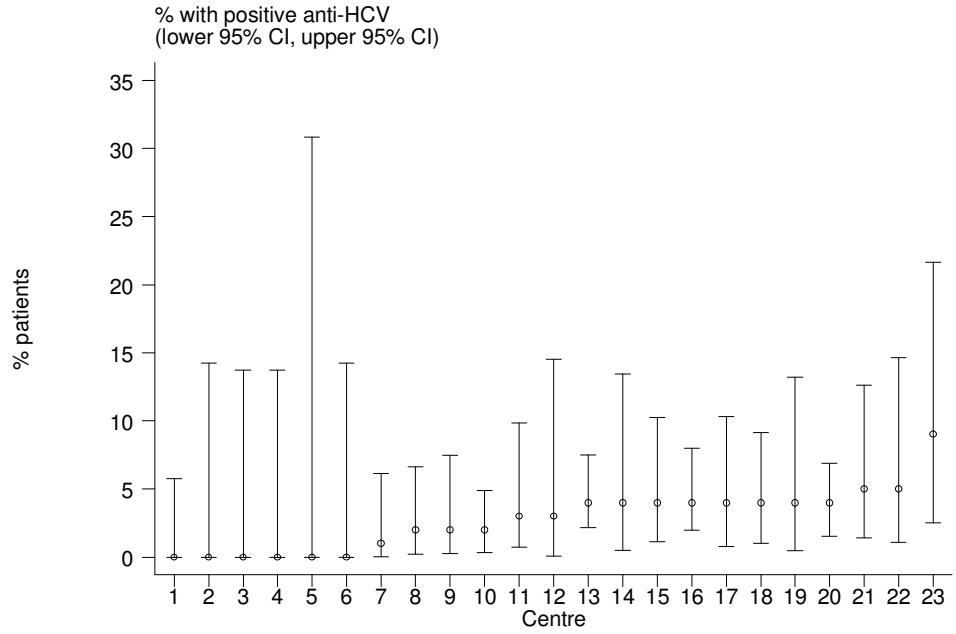


Table 11.7a: Risk factors in relation to HD practices for seroconversion to anti-HCV positive among sero-negative patients

Risk factor	Number of patients	Risk Ratio	95% CI	p-value
Assistance to Perform HD				
(1) Self care (ref)	175	1.00		
(2) Partial self care	140	0.70	(0.56, 0.87)	0.002
(3) Completely assisted	361	0.45	(0.37, 0.54)	0.000
Dialyzer Reuse				
(1) less than 10 (ref)	310	1.00		
(2) more than 10	392	0.85	(0.73, 0.99)	0.041
Dialyzer Reprosessing System				
(1) Fully Auto (ref)	369	1.00		
(2) Semi Auto	47	0.77	(0.57, 1.05)	0.095
(3) Manual	37	0.82	(0.59, 1.16)	0.269
Age				
(1) <=20 (ref)	40	1.00		
(2) 21-40	235	0.80	(0.57, 1.13)	0.209
(3) 41-60	330	0.42	(0.30, 0.59)	0.000
(4) >60	97	0.18	(0.12, 0.26)	0.000
Gender				
(1) Female (ref)	281	1.00		
(2) Male	421	1.16	(1.00, 1.35)	0.056
Diabetes				
(1) No (ref)	522	1.00		
(2) Yes	180	0.36	(0.30,0.42)	0.000
Previous Renal Transplant				
(1) No (ref)	584	1.00		
(2) Yes	118	4.95	(4.02, 6.10)	0.000
History of Blood Transfusion				
(1) No (ref)	395	1.00		
(2) Yes	307	1.40	(1.21,1.63)	0.000

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 had a lower risk of acquiring HCV infection, and interestingly diabetic patients had lower seroconversion risks. Completely assisted patients are fully assisted by trained staffs and thus more stringent infection control measures may be practiced with these patients compared to self assisted and partially assisted patients. Completely assisted patients also tend to have more co morbidities such as diabetes, and as such this may explain why there is a lower tendency to acquire HCV infection among diabetics.

Table 11.7b: Risk factors for seroconversion to anti-HCV positive among sero-negative patients in PD

Risk factor	Number of patients	Risk Ratio	95% CI	p-value
Age				
(1) <=20 (ref)	4	1.00		
(2) 21-40	22	3.54	(1.21, 10.32)	0.021
(3) 41-60	26	1.99	(0.69, 5.72)	0.202
(4) >60	3	0.35	(0.08, 1.58)	0.172
Gender				
(1) Female (ref)	28	1.00		
(2) Male	27	0.97	(0.57, 1.65)	0.900
Diabetes				
(1) No ref	46	1.00		
(2) Yes	9	0.23	(0.11, 0.47)	0.000
Switch from PD to HD				
(1) No (ref)	35	1.00		
(2) Yes	20	6.81	(3.89, 11.93)	0.000
Previous Renal Transplant				
(1) No (ref)	48	1.00		
(2) Yes	7	2.50	(1.12, 5.58)	0.026
History of Blood Transfusion				
(1) No (ref)	23	1.00		
(2) Yes	32	2.29	(1.33, 3.92)	0.003

Similar to HD, previous renal transplant and blood transfusion were risk factors for seroconversion. CAPD patients who were switched from HD also tended to have a higher risk. This may be due to previous exposure to Hepatitis C while they were on HD. Similar to HD, there was also a trend for increased risk of seroconversion in younger patients. This finding need further studies looking into other factors for acquiring hepatitis C which may be more prevalent in younger patients such as sexual promiscuity, use of recreational drugs etc.

Conclusion

Nosocomial transmission in HD has been implicated for the higher HCV prevalence in HD compared to PD. Even though our efforts to reduce the overall prevalence of HCV in HD have been successful, a wide center to center variation still remains, especially for HCV infection. The challenges for the future would be to prevent new seroconversion within the HD facility and for this we will need to look into aspects of our current HD practices such as dialyzer reuse practices, degree of infection control measures practiced as well as staffing level.