

Prevalence of Anti-HCV in Hemodialysis Patients

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SUMMARY

Eighty two patients, 55 males and 27 females, aged 18 to 80 years (mean 42.32 ± 14.95 years) on chronic hemodialysis were screened for sero-markers of hepatitis B and C and their liver function was evaluated. Fifty one patients (62.2%) showed anti Hepatitis C antibodies (anti HCV) in their serum. Seven patients (8.5%) were Hepatitis B surface antigen positive; five of them were positive for both anti HCV and HBsAg. Liver functions tests were performed in 70 patients; 22 of them had abnormal liver function. Out of these, 18 patients (81.8%) were anti HCV positive and 4 cases (18.2%) were negative for anti HCV antibodies ($P < 0.05$). Eighteen of anti HCV positive (39.1%) and 4 of anti HCV negative (16.7%) had abnormal liver functions. Out of 51 Anti HCV positive patients 43 had received blood transfusions (84.3%) while 8 patients (15.7%) did not have any transfusion ($P < 0.05$). The patients, who were Anti HCV positive, had more blood transfusions and were on hemodialysis for longer periods as compared to Anti HCV negative patients but the difference in our study was not statistically significant.

INTRODUCTION

The incidence of viral hepatitis has reduced in hemodialysis units during past 20 years with improved infection control strategies including patients surveillance, segregation, improved prophylaxis with immune globulins hepatitis B immune globulins, hepatitis vaccine and disinfectant procedures¹. But Non-A, Non-B hepatitis still appears to be the major cause of hepatitis in hemodialysis units^{2,3}. Non-A Non-B Hepatitis (NANBH) remains the serious consequence of blood transfusion. More than 90% of transfusion induced hepatitis cases in the world are attributed to NANBH. It also accounts for upto 25% of sporadic cases of acute viral hepatitis^{4,6} 10% of transfusions are reported to result in NANBH. Disturbances in liver functions suggestive of hepatitis in patients on chronic hemodialysis have been observed frequently. In many of these cases causes were not known. Most of the studies in this regard deal with role of hepatitis B virus infection⁷⁻⁹.

The epidemics of non-A, non-B hepatitis have been reported in hemodialysis units with an attack

rate of 5%¹⁰. Non-A, Non-B hepatitis is caused by several viruses and they can transmit infection and confer specific immunity in humans and chimpanzees. In the past, the diagnosis of non-A, non-B hepatitis had been made by ruling out other causative viruses and hepatotoxic agents. A system for the detection of the non-A, non-B virus has been elusive, but such a system has been reported since the recent cloning of this agent, now tentatively designated the hepatitis C virus. Both radioimmune and enzyme-linked assays have developed to detect antibody (anti-HCV) to the protein expressed in the cloning experiments^{11,12}.

Since the availability of test for Anti-HCV, preliminary surveys on hemodialysis patients have shown 15-53.7% prevalence of anti-HCV¹³⁻¹⁷.

Some reports have appeared in the literature which show that HCV is the main cause of acute and chronic liver disease in hemodialysis patients.

The present study was conducted to see the prevalence of antibodies to hepatitis C virus (Anti-HCV) in our hemodialysis patients and to see if there is any association of HCV to liver disease in these patients.

SUBJECTS AND METHODS

Eighty two patients with end stage renal disease on maintenance hemodialysis registered in various treatment centers of Lahore were included in the study. They were screened for HBV markers (HBsAg, Anti HBc and Anti-HBs). Liver function tests and Anti HCV were done. Peripheral blood of these patients was taken, sera was separated and stored at -20°C till the assay was done. An EIA test to detect anti-HCV (Abbott Diagnostics) was used. The manufacturer's protocol was strictly observed, which stated that positive cases should be repeated. History of these patients was taken with due consideration to age, sex and history of jaundice, duration of dialysis and number of blood transfusions given during the course of illness.

RESULTS

The age and sex distribution of these patients is shown in Table 1.

Parameters	No.	Percent
No. of cases	82	100.00
Sex		
Male	55	67.1
Female	27	32.9
Age (years)		
11 - 20	2	2.4
21 - 30	23	28.0
31 - 40	17	20.7
41 - 50	17	20.7
51 - 60	14	17.1
61 - 70	8	9.8
71 - 80	1	0.12

Of the 82 patients analyzed, 51 were positive (62.2%) and 31 were negative for anti-HCV antibodies (37.8%). HBsAg was positive in 7 patients (8.5%) and negative in 75 patients (91.5%). Liver function tests were performed in 70 patients; 22 of them (31.4%) had abnormal liver function tests especially elevated serum transaminase activity. These results are shown in Table 2.

Table 2: Results of liver function tests and HCV/Hbs/HbsAg status.

	Value	Frequency	Percentage
HBsAg	Negative	75	91.5
	Positive	7	08.5
Anti HBs	Negative	42	51.2
	Positive	40	48.8
Anti HCV	Negative	31	37.8
	Positive	51	62.2
LFTs	Normal	48	68.6
	Abnormal	22	31.4

History about the duration of dialysis was available in 73 cases. Mean duration was 13.96 ± 1.74 months (range 2-72 months). In patients with positive Anti-HCV, duration of dialysis was 15.9 ± 2.37 months while it was 10.9 ± 2.39 months in anti HCV negative patients. The difference was not statistically significant. Transfusional history was available in 79 cases. Out of these 79 patients, 65 had received blood transfusion while 14 did not. Out of 51 anti HCV positive patients 43 had received blood transfusion (84.3%) and 8 did not get any transfusion (15.7%). This difference was statistically significant with p value less than 0.05. All HBsAg positive patients gave history of blood transfusion. Among 65 cases who received blood transfusion, information about number of transfusions was available in 47 cases. Mean number of blood units transfused was 4.45 units (range 1-25 units). Anti-HCV positive patients received 4.17 ± 1.03 units, while Anti-HCV negative patients received $3.42 \pm$. Although difference did exist, but statistically not significant.

Table 3 shows the comparison between Anti-HCV positive and negative cases with references to transfusional history, seromarkers of hepatitis B infection (HBsAg & Anti-HBs) and liver function tests.

DISCUSSION

Several studies have shown that almost 90% of case of transfusion-associated hepatitis are due to non-A non-B hepatitis agent^{4,6,18}. The serological studies have now confirmed that HCV is mainly

Table 3: Comparison of anti HCV positive and negative patients

Status studied	Anti-HCV +ive		Anti-HCV -ive		P value
	No.	%	No.	%	
No. of cases	51	100.00	31	100.00	
Transfusion					
Negative	8	15.7	6	21.4	NS
Positive	43	84.3	22	78.6	NS
HBs Ag					
Negative	46	90.2	29	93.5	NS
Positive	5	9.8	2	6.5	NS
Anti HBs					
Negative	22	43.1	20	64.5	NS
Positive	29	56.9	11	35.5	NS
LFTs					
Normal	28	60.7	20	83.3	NS
Abnormal	18	39.1	4	16.7	< 0.05

responsible for these NANB hepatitis cases and if there is a separate agent it will account for a very few cases of NANB hepatitis¹⁹⁻²⁰. Acute NANB hepatitis is usually mild and may be anicteric and asymptomatic. Fulminant cases have rarely been observed. Almost 50% of cases develop chronic liver disease like chronic active hepatitis and cirrhosis¹⁹. An extremely strong correlation between anti HCV status and hepatocellular carcinoma has also been reported²¹⁻²³. Twenty two patients in our study had abnormal liver function tests. Eighteen of them (84.3%) were anti HCV positive and 4 were anti HCV negative (15.7%). All of them were asymptomatic from liver dysfunction. None of them had clinically overt jaundice. Significance of this abnormal liver function in these patients is unknown at present.

Hepatitis C is a common problem in hemodialysis patients. Present study demonstrates that HCV infection is widespread in hemodialysis patients as indicated by high prevalence rate of 62.2% of anti HCV antibodies in these patients. This prevalence rate is significantly higher than the figures of 1% reported from UK²⁴, 28.6% in Italy²⁵, 15.6% in United States¹⁴ 18.4% in Germany²⁶ and 20% in Spain¹³. Our results are in agreement with a recent report of prevalence rate of 53.7% of anti HCV antibodies among hemodialysis patients in Saudi Arabia¹⁷. Another report from Spain showed a

prevalence rate of 48% in hemodialysis patients at the time of renal transplantation²⁷. This report showed that HCV was closely related with the length of time patient had been on hemodialysis as well as the number of blood units transfused. However, in our study, anti HCV positive patients have been on hemodialysis for longer periods and they received a higher number of blood units but the difference from anti HCV negative patients was not statistically significant.

The anti-HCV positivity may reflect HCV past exposure just like IgM anti-HBc reflects recent or IgG anti-HBc reflects past exposure to HBV.

We investigated the route of transmission of hepatitis C virus among our patients. Many of these patients had acquired this infection through blood transfusion. Others, who were positive for anti-HCV, could have gained this infection through other routes perhaps similar to that of HBV transmission in this environment. Cross infection due to close contact with each other and use of common equipment in addition to transfusional requirement, may be responsible for high anti HCV positivity in dialysis patients¹⁴. Other possible routes of transmission of this infection may be intravenous drug abuse, intrafamilial spread or acquisition through sexual contact with carriers similar to what has been described for HBV. These seem unlikely in our patients because they denied any history of drug addiction or history of overt jaundice in family members.

Further studies including measurement of HCV antigen, when assays for this becomes available, are essential in order to ascertain the mode of transmission.

The present study, however highlights the following points.

1. There is high prevalence of Anti-HCV in our hemodialysis patients.
2. There is no association with number of blood transfusion or duration of dialysis.
3. There is association between positive Anti-HCV and history of blood transfusion.
4. Patients who are Anti-HCV negative have less prevalence of abnormal liver function tests.
5. Hemodialysis patients with abnormal LFTs have high prevalence of Anti-HCV.

We suggest following precautionary measures, which should be observed in hemodialysis units to prevent the transmission of Hepatitis C virus: (1) erythropoietin should be used to correct anemia in renal failure patients, instead of blood transfusions.

Blood transfusion should be limited to those cases who are unfit for erythropoietine therapy or those who are going for transplantation; (2) blood or blood products to be transfused into hemodialysis patients should be screened for anti-HCV and those found positive should be discarded; (3) screening procedure should be adopted in each blood transfusion unit of the country; (4) separate dialysis machines should be used for patients who have positive Anti-HCV as is the practice with HBsAg positive cases; (5) dialysis machines should be sterilized thoroughly after each dialysis; (6) follow-up of the patients by their liver function tests and seromarkers of hepatitis should be done routinely.

ACKNOWLEDGEMENT

This study was partly sponsored by SK & F and Abbott Diagnostics. We are thankful to Dr. Iffat Yazdani Medical Director SK & F and Dr Mohammad Arshad Medical Director Abbott for their help. We also acknowledge Dr. Anwar A. Khan for his suggestions and Mr. Majid Ehsan and Sabir Ali for computer analysis.

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