

Original article:

Prevalence of HCV Infection in Hemodialysis Patients of South Khorasan in Comparison With HBV, HDV, HTLV I/II, And HIV Infection

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Abstract:

Background and objective: This study was performed to evaluate the prevalence of Hepatitis C virus (HCV) infection as well as HBV, HDV, HTLV I/II, and HIV infection in hemodialysis patients in our district.

Methods: The subjects of this study involved 41 hemodialysis patients admitted to hemodialysis ward, Vali- Asr hospital. HBV, HDV, HIV, and HTLV1/2 infections were evaluated by enzyme-linked immunosorbent assay (ELISA) technique. Serum anti- HCV anti-body was measured using the 3rd generation of ELISA kit. HCV Viremia was evaluated in all patients using RT-PCR technique.

Results: HCV infection was not observed in none of patients by ELISA technique; however RT-PCR technique demonstrated HCV viremia in one (2.43%) patient. HBsAg was detected in 4(9.75%) patients, and one (2.43%) was Anti HTLV 1/2 positive; none of patients were HDV or HIV positive.

Conclusion: HCV infection is less common than HBV infection in our patients. ELISA technique can not demonstrate all hemodialysis patients with HCV infection, For this reason it is requirement to evaluate this group of patients for HCV infection using RT-PC technique.

Keywords: Hemodialysis, Hepatitis C, Hepatitis B, HIV Infections, HTLV I/II Infections

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Introduction

Hepatitis C virus (HCV) infection is the most common chronic blood borne infection in the world¹. Estimated global prevalence of HCV infection is 3%². It is estimated that 5-20% of HCV- infected patients will develop cirrhosis, 1-4% of whom will annually develop hepatocellular carcinoma^{2,3}. Hepatitis C is the major cause of liver disease among patients with chronic renal failure⁴. Patients with chronic renal failure are at higher risk of acquiring blood borne infections including viral hepatitis and HIV infection⁵. Thus the routine evaluation of hemodialysis patients for blood borne infections including HCV infection is recommended⁵⁻⁶.

Nowadays, ELISA is the most used technique for

HCV infection. Although the ELISA technique has been improved in last decades and different generations of ELISA kits have developed; however it could not diagnose all patients with Hepatitis C⁷. PCR technique has been developed in last decades for detecting patients with Hepatitis C as well as viremia suspicious persons⁸. This study was performed to evaluate the prevalence of HCV infection in comparison with other viral blood borne infections in hemodialysis patients in our district.

Methods

This cross-sectional study was performed on hemodialysis patient that referred to hemodialysis ward of Vali-Asr hospital, Birjand, Iran. Birjand is the capital of South Khorasan province, eastern state, of Iran with a total population of nearly 400,

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000. Hemodialysis ward of Vali-Asr hospital is the main center where hemodialysis patients were admitted. The subjects of this study were included all hemodialysis patients who were admitted during fall of 2010.

Subjects were interviewed about their demographic characteristics and their medical history as well. A blood sample was collected at enrollment. All serum samples were analyzed by ELISA technique in terms of HCV antibody (Dia-pro diagnostic ® HCV ELISA, Italy), HBs Ag (Dia lab ® HBs Ag, Italy), and anti HIV antibodies (Dia lab ® HIV Ab, Italy) and anti-HTLV 1/2 antibodies (Dia labs ® Diagnostic HTLV 1/2, Italy) as well.

Serum HCV-RNA was qualitatively analyzed for all serum specimens by nested reverse transcriptase polymerase chain reaction assay (RT-PCR) (Cinnagen ® HCV-RNA, Iran). Ethical approval was obtained from the ethics committee of Birjand University of Medical Sciences. Written informed consent was signed from the patients at enrolment.

Results

In this study we evaluated forty-one hemodialysis patients, who twenty-eight (68.3%) was male. Mean age of the patients were 54.93 ± 16.46 years. The mean of duration of hemodialysis was 16.02 ± 16.98 months; the details are listed in Table 1.

HCV infection was not diagnosed in none of patients by ELISA technique, but RT-PCR technique showed the viremia in one (2.43%) patient. This patient was HBs Ag positive and had history of inguinal hernia surgical repair (10 Years ago) and blood transfusion due to anemia due to CRF as well. Four (9.75%) out of 41 patients were HBs Ag positive, and one (2.43%) was Anti HTLV 1/2 positive. Furthermore, none of the patients were HDV or HIV positive.

Discussion

This study indicated that average prevalence of HCV infection among hemodialysis patients, with at least one year or more history of hemodialysis, in Birjand is 2.43%. The reported prevalence of HCV infection among hemodialysis patients varies from 1.9% in the Slovenian to 89.6% in Saudi Arabia⁴⁻⁹. Reported prevalence of the infection from different parts of Iran varies from 5.5% in Shiraz to 55.9% in Rasht¹⁰⁻²⁰. From the data, it was observed that the infection is less prevalent among hemodialysis patients in our region comparing with other regions

of Iran. This finding could be attributed to lesser prevalence of HCV infection in normal population of South Khorasan.

Ghafouri et al. reported that only 0.054% of first-time blood donors in South Khorasan had HCV infection²¹. This is nearly one third of prevalence of this infection in the country prevalence of infection in this region is nearly one-third². The prevalence of HCV infection among hemophilia patients of South Khorasan is less than other parts of Iran as well²².

Furthermore, our study observed that HCV RNA was found in one patient (2.4%), while Anti HCV antibody was not found in none of patients by ELISA technique. Thus, there are some other studies showing the deficiency of ELISA in detecting all patients with HCV infection^{8,23-24}. In hemodialysis patients, the reported Prevalence of HCV RNA positive/ HCV-Ab negative was varied from 0-12%⁴. This phenomenon could be due to deficiency of antibody production in hemodialysis patients, as well as long window period of HCV infection in hemodialysis patients²⁴.

From this data it can be argued that 9.75% of our patients were HBs-Ag positive. This is higher than other reports from Iran which the prevalence of HBV infection in hemodialysis patients varies from 2.4 to 6.72 percents^{14,16,18,25-30}. This could be due to that none of patients had completed their HBV vaccination program till this study.

Based on the data of this study, all patients except one (2.43%) had not HTLV I/II infection. This result is similar to reported studies about rate of the infection among hemodialysis patients from other regions^{23,31-33}. As respects, this patient had history of hemodialysis for three years and none of other hemodialysis patients, which were hemodialysed simultaneously in same center had not HTLV I/II infection, It seems that hemodialysis machines could not transmit the HTLV I/II infection. There are other studies in which this conclusion can be seen^{34,35}. All of our patients were without any HIV infection. This is not surprise finding as the HIV infection in normal population of our province is very rare²¹.

Conclusion

We concluded that, HCV infection is less common than HBV infection in our patients. Since all

hemodialysis patients with HCV infection could not be found by ELISA technique, hence it is needed to evaluate this group of patients for HCV infection by RT-PCR. Another outstanding finding of the study is that it seems that HTLV 1/2 infection are not transmissible via hemodialysis machines.

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