

Prevalence of hepatitis C virus infection in dialysis patients

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Abstract

Hemodialysis patients are at particularly high risk for hepatitis C virus infection because of the exposure to blood products and contaminated equipment. The high prevalence of HCV infection in dialysis patients is of great concern because these patients have a higher mortality than HCV negative patients.

Our study aimed to evaluate the prevalence of HCV infection among patients at our dialysis unit.

A cohort of 178 patients on maintenance hemodialysis at the Department of Nephrology, Clinical Center Skopje, was retrospectively evaluated for the levels of transaminases and the number of transfused blood products. The presence of HCV antibodies was determined by second-generation assay and the presence or absence of HCV RNA in the serum of the patients was determined by reverse-transcriptase PCR.

The results from this study showed that from 178 patients, 114 (64%) were anti-HCV positive and 64 (36%) were anti-HCV negative. The duration of dialysis, transaminase levels and number of transfusions was significantly higher in anti-HCV positive group of patients when compared with the anti-HCV negative group.

The high prevalence of anti-HCV positive patients in our dialysis unit was associated with greater dialysis duration, blood products transfusions and liver enzyme levels. Measures to prevent the spread of HCV in dialysis units should include isolation of HCV RNA positive patients equipment and possibly their treatment with interferon therapy.

Key words: hepatitis C virus, prevalence, dialysis patients

Introduction

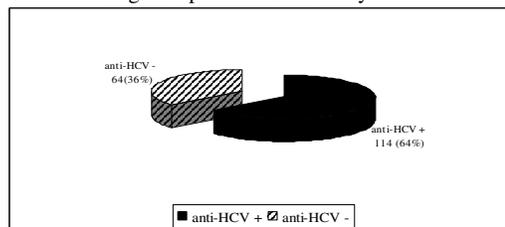
Hemodialysis patients are at particularly high risk for hepatitis C (HCV) virus infection because of the exposure to blood products and contaminated equipment. There is considerable variation in the prevalence of anti-HCV in dialysis units worldwide, ranging from as low as 1% to as high as 63%. Risk factors for spread include a history of transfusion, number of blood products transfused, and number of years on hemodialysis therapy (1). The high prevalence of HCV infection in dialysis patients is of great concern because these patients have a higher mortality than HCV negative patients (2). Although HCV transmission through blood products transfusion previously was a

significant source of infection, current cases are more likely related to nosocomial exposure (3). Hepatitis C virus is characterized by spectrum of outcomes. Asymptomatic in the vast majority of patients, transition from acute to chronic infection is usually without notice (4,5). In addition to viral and environmental factors, host genetic and immunological factors are believed to exert an impact on outcome of HCV infection (6). The mechanisms involved in viral clearance are not yet fully understood, although increasing evidence suggests that cellular immune responses to HCV play a central role (7). The aim of this study was to evaluate the prevalence of HCV infection among patients at our dialysis unit.

Patients and Methods

The study was carried on 178 (113 men) patients on maintenance hemodialysis at the Department of Nephrology, Clinical Center, Skopje. The mean age of patients was 54.8 years and mean time on dialysis 86 months. The levels of liver aminotransferase enzymes: alanine aminotransferase (ALT) and aspartate aminotransferase (AST), and the number of transfused blood products, were recorded from the histories of the patients. The presence of HCV antibodies was determined by second-generation assay. The presence or absence of HCV RNA in the serum of the patients was determined by reverse-transcriptase PCR (RT/PCR) at Research Center for genetic engineering and biotechnology, Macedonian Academy of Sciences and Arts, Skopje. Student's t-test was used for group mean comparison between anti-HCV positive and anti-HCV negative patients.

Fig 1. Distribution of anti-HCV positive and anti-HCV negative patients in the study



Results

The results from this study showed that from 178 patients, 114 (64%) were anti-HCV positive and 64 (36%) were anti-

HCV negative (Figure.1).
The mean values of age, duration on dialysis, levels of AST and ALT, and number of transfusions in anti-HCV positive

and anti-HCV negative patients, and comparison between them are given in Table 1.

Table 1. Mean values of age, duration on dialysis, levels of AST and ALT, and number of transfusions, and comparison between anti-HCV positive and anti-HCV negative patients

	anti-HCV positive	anti-HCV negative	p value
age (years)	53.81 ± 13.61	56.62 ± 12.06	NS
duration (months)	103.7 ± 71.6	53.41 ± 33.7	0.00
AST (U/L)	37.87 ± 21.96	23.05 ± 11.63	0.00
ALT (U/L)	53.74 ± 34.71	25.06 ± 14.05	0.00
No. of transfusions	8.91 ± 13.53	4.84 ± 5.27	0.03

The duration of dialysis in months was significantly longer in anti-HCV positive than in anti-HCV negative patients (103 vs. 53, $p < 0.00$). The levels of AST and ALT were significantly greater in anti-HCV positive than in anti-HCV negative patients (37.87 vs. 23.05 $p < 0.00$) and (53.74 vs. 25.06, $p < 0.00$), respectively. The number of transfused blood products was significantly greater in anti-HCV positive than in anti-HCV negative patients (8.91 vs. 4.84, $p < 0.03$). The age of anti-HCV negative patients tended to be greater than the age of anti-HCV positive ($p = NS$).

Among 114 anti-HCV positive patients, 55 (48%) patients remained HCV RNA positive and 59 (52%) patients underwent spontaneous viral clearance becoming HCV RNA negative. Almost all HCV RNA positive patients were infected with HCV genotype 1 (96.4%). Except those infected with genotype 1, two patients (3.6%) were infected with genotype 4.

Conclusions

There is high prevalence of anti-HCV positive patients (64%) in our dialysis unit, which is significantly associated with dialysis duration, blood products transfusions and liver aminotransferase levels. Assessing the natural history of hepatitis C in patients on dialysis is obscure because of the unique characteristics of this population. The absence of

HCV RNA at 52% of anti-HCV positive patients indicates spontaneous clearance of the virus. Measures to prevent the spread of HCV in dialysis units must include dialysis unit specific precautions, routine serological and HCV RNA testing, isolation of HCV RNA positive patients on dedicated machines, and if possible their treatment with interferon therapy.

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