



## Prevalence of HCV and HBsAg in Hemodialysis Patients

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### Abstract

**Introduction:** Hemodialysis is a solution for terminal patients with Chronic Renal Diseases (CRD). In addition to the fact that hemodialysis improves the prognosis and quality of life of patients with CRD, these patients are often risk to develop infectious pathologies such as HCV and HBV.

**Purpose:** Of this study is to assess the prevalence of HCV and HBV in haemodialysis patients and to analyse the risk factors that increase this prevalence.

**Methodology:** This is a descriptive study where 60 patients with CRD are treated with haemodialysis at the district haemodialysis centre. Socio-demographic data and results of laboratory tests were collected from patient records. Laboratory tests consisted in identification of anti-HCV and HBsAg. The statistical analyzes were based on t-student and chi square test.

**Results:** Our data showed that HCV prevalence was 23.3% and HBsAg 3.3%. The average age of the patients was 51.77 years and that the most frequent pathology of CRD patients was diabetes mellitus with 25.0%, followed by high blood pressure 18.3%.

**Conclusions:** HCV prevalence in haemodialysis is higher than in the healthy population. The risk factor for taking HCV and HBV was seen to be duration time of haemodialysis

**Keywords:** Albania; Hepatitis C; Haemodialysis; Prevalence

### Abbreviations

HCV: Hepatitis C Virus; HBV/HBsAg: Hepatitis B Virus; CRD: Chronic Renal Diseases; DM: Diabetes Mellitus; HBP: High Blood Pressure; KS: Kidney Stones; GD: Genetic Diseases; RI: Recurrent Infections

### Introduction

Dialysis patients, suffering from chronic renal disease are a special group, in which evolution, prognosis and treatment options for HCV-related liver disease remain problematic [1]. Haemodialysis is a solution for terminal patients with Chronic Renal Diseases (CRD). In addition to the fact that Haemodialysis improves the prognosis and quality of life of patients with CRD, these patients are often exposed to the risk of getting infections because of constant contact with hemodialysis machine which may be contaminated or through blood transfusion. Also these patients have a weak immune system, which makes them get infected easier [2,3]. Hepatitis C virus represents a major problem nowadays as HCV cases in dialysis patients are growing steadily.

Worldwide, chronic hepatitis C virus has a prevalence between 5% and 60% depending on the geographical region [4,5]. In Europe, the incidence of HCV infection among hemodialysis patients is higher than that of the general population, varying from one region to another: lower in the north (England 2%, Sweden 8.8%), and higher in the south as Spain 25%, Italy 27%, Turkey 30% [6,7].

The prevalence of hepatitis C in Europe is seen to be lower compared to other countries in the world. In Europe, the prevalence of hepatitis C is under 2.5%, but this may change in different places [8-13]. While the prevalence of HBsAg in different country ranges from less than 1% to 20% in patients on regular hemodialysis [14]. In France, Germany, Italy, Spain, United Kingdom, Japan and the United States) in haemodialysis patients the prevalence of HBsAg is average 3%, with a median of 1.9% [15]. In Albania, studies conducted about the prevalence of HCV and HBV in dialyzed patients are very rare. The prevalence of anti-HCV in dialysis patients is 43.02% [16], while in health population as in voluntary blood donors the prevalence was 0.07% and HBsAg 7.9% [17,18], refugee

Albania in Greece 2.3% [19], in patients with hepatic and / or alcoholic problems showed that prevalence of anti-HCV was 11% [20].

The aiming of this study is to evaluate the prevalence of HCV and HBsAg in district haemodialysis center and analyze the factors that increase the prevalence of hepatitis C as well as frequently pathology that induced CRD.

## Methods

The study was performed in 60 patients. The data was collected from patient interview and clinical records. Patients included in this study were subjected of dialysis an average 5 years.

### Determination of haemodialysis time

The Haemodialysis duration time (in year) was estimated by counting years that patient performed the haemodialysis from the first time until the time, when data entry was completed.

### Laboratory tests

Haemodialysis patients have performed several laboratory tests during treatment. The patients were tested by ELISA method for anti HCV and HBsAg. A patient was considered as Anti-HCV and HBsAg positive when found two times repeatedly reactive with Elisa method.

### Statistical methods

The variables included in the study are: demographic data (races, age, gender), number of dialysis, HCV infection, HBsAg, causes

of CRD. Comparison of data between groups was achieved with t-test student and the percentages were compared with the chi square. Qualitative data were expressed in percentages and quantitative data on average  $\pm$  standard deviation.

## Results

Our data in table 1 show that average age of patients is  $51.77 \pm 11.2$ . According to race, 57 out 60 patients included in study belong to the white race. According to gender 76.67% were male gender and 23.33% are female.

Characteristics	Total
Patients	(n) 60
Age (mean $\pm$ standard deviation)	51.77 $\pm$ 11.2
Men (n /%)	46 (76.67%)
Female (n /%)	14 (23.33%)
White (n / a)	57/60 (95%)
Starting hemodialysis in the clinic (n /%)	41 (68.33%)

**Table 1:** Demographic data.

Our data in table 2 show distribution of diseases that progress in chronic renal disease. So, the frequency diabetes mellitus (DM) is 25.0%, followed by high blood pressure (HBP) with 18.3% and kidney stones (KS) and genetic diseases (GD) 11.66%. While 8.3% of patients reported that they didn't know the cause of kidney failure.

Patients / pathology	Renal cyst	Diabetes Mellitus	Hight blood pressure	Recurrent infections	Kidney stones	Genetic diseases	Other	No know	Total
No	7	15	11	4	7	7	4	5	60
%	11.66	25	18.33	6,67	11.66	11.66	6.66	8.33	100

**Table 2:** Distribution of pathology that causing CRD.

Our data in table 3 show that 14 out of 60 patients tested were found to be anti-HCV positive (23.33%) and 2 out of them were HBsAg positive. According to gender anti HCV positive were 28,26% in male and 7.14% in female, while HBsAg was 14.28% in female. We haven't any positive case between male.

The data in table 4 show that patients who had performed dialysis more than 5 years the prevalence of anti-HCV is 33.3%. While in patients who had performed dialysis less than 5 years the prevalence was 15.15%. Statistical analysis between positive anti-HCV cases for dialysis time showed a  $P < 001$ . In this stusy haven't any

Tests	Anti HCV poz		Anti HCV neg		HBsAg poz		HBsAg neg		Age (mean $\pm$ standard deviation)
	N	%	N	%	N	%	N	%	
Men	13	28.26	33	71.74	0		0		50.86 $\pm$ 11.6
Female	1	7.14	13	92.86	2	14.28	12	85.72	52.04 $\pm$ 11.2
Total patients	14	23.33	46	76.67	2	3.33	58	96.67	

**Table 3:** Prevalence of HCV and HBsAg in dialysed patients.

Dialysis duration	Patients No.(n/%)	Men No.(n/%)	Anti- HCV No.(n/%)	HBsAg No.(n/%)	Age (Mean ± StDev)	BMI (Mean ± StDev)
<5 years	33 (55)	22 (66.67)	5 (15.15)	0	56.45 ± 11.4	25.56 ± 4.7
≥ 5 years	27 (45)	24 (88.89)	9 (33.33)	2(7.4%)	48.44 ± 11.2	22.77 ± 4.6
P-value	P.S	P.S	P=0.00085	P=0.00015	P = 0.018278	P = 0.035118

**Table 4:** Clinical data according to dialysis duration.

HBsAg positive case in patients who had performed dialysis less 5 years, while in patients who had performed dialysis more than 5 years the prevalence of HBsAg was 7.4%.

The average age of patients who had less than 5 years of hemodialysis was 48.44 ± 11.2, while the average age of patients who had more than 5 years of hemodialysis was 56.45 ± 11.4. Statistical analysis with t-student test reported a P < 0.05.

## Discussions

HCV and HBV infection has a strong impact on mortality in HD patients, so treatment of hepatitis C and B in these patients is difficult to establish. Early detection of HCV and HBV infection is important in patients with chronic renal diseases who are treated with Hemodialysis (HD) because of the high risk of infection in these group patients. Early detection of these markers could result in better management of patients and a reduction patient-to-patient transmission of viral hepatitis in HD units [2]. The prevalence of hepatitis C virus (HCV) infections among hemodialysis patients varies from country to country. So, it ranging from 5% in northern Europe to 10% in southern Europe and United States and 10%-70% in many countries of northern Africa, Asia and South America [5]. The prevalence of HCV among hemodialysis patient can vary considerably not only from country to country but often between HD center within the country, because of limited number of dialysis patients and epidemiological characteristic.

Hepatitis C virus is a major problem in hemodialysis centres because of higher prevalence in these units compared to the healthy population and other chronic patients. In our study anti-HCV in the district Haemodialysis center was found to be 23.3% and HBsAg 3.33%, while in HD unit in University hospital "Mother Tereza" the HCV prevalence was 24% and HBsAg 14% [21]. Compared with previously study carry out in Albania (43% in 2014), HCV prevalence and HBsAg was lower [16]. Comparing with health population the HCV prevalence in haemodialysis patients in our study was higher than healthy population, while HBsAg prevalence was lower than in healthy population [18]. The low prevalence of HBsAg in these group patients may be as result the small number of patients included in this study and other factor as vaccination program of population etc.

Compared to other European countries, the prevalence of anti HCV in our patients was higher than developed countries as 2% in UK and 20% in Italy [22]. Various studies have shown that the prevalence of hepatitis C and B is depended from some factors as number of transfusions, prolonged vascular access, the potential for exposure to infected patients and contaminated equipment, hemodialysis sessions number, gender, race, associate diseases [23].

Based on the our data, anti HCV prevalence appears to be higher in males with 76.67% than female (table3) while HBsAg was higher in female. According to race the prevalence was higher in white race with 95% than black race.

With regard to the mean age, it was found that patients treated more than 5 years with haemodialysis reported a lower average age of 48.44 ± 11.2 compared to patients who had less than 5 years of haemodialysis. This is an indicator showing that the diseases leading to terminal chronic renal failure are better controlled by increasing the average age of CRD patients who start the haemodialysis process. According to gender, males (over 13%) are more affected by haemodialysis than females.

In our study we have analysed the responsible pathologies that led to terminal stage of CRD. Our data show that diabetes mellitus stands first with 25.0%, followed by high blood pressure with 18.3% and then with the same percentage 11.67% are renal cysts, kidney stone, hereditary pathologies and 6.67% reported to be recurrent infections and other reasons, while 8.33% unknown reason that has led to CRD. Many studies referred diabetes mellitus as one of the major causes of terminal CRD [24,25].

In this study, patients are divided into 2 groups; those who have over 5 years treated with Haemodialysis and patients who have less than 5 years treated with Haemodialysis. Based on our study we observed that patients treated more than 5 years with hemodialysis, the anti- HCV and HBsAg prevalence was higher than other group. The anti HCV prevalence was nearly twice higher (33.3%) compared with those who have been treated with haemodialysis (15.2% table 3) less than 5 years. Statistical analysis between positive anti-HCV cases and duration time of hemodialysis treatment showed a P < 0.01. This indicates that duration time of haemodialysis

sis treatment is a risk factor, because it increases the risk of exposure to infectious diseases.

## Conclusions

In our study, the prevalence of Hepatitis C was 23.3%, which is higher than prevalence reported in the total population, but stands at the same values compared with anti-HCV prevalence reported in Europe's developed countries. While the prevalence of HBsAg in this group patients was lower than healthy population. The risk factor that influenced in increasing the prevalence of hepatitis C and B was found to be duration time of haemodialysis treatment. So the prevalence of anti HCV and HBsAg was higher in patient who were treated more than 5 years with haemodialysis. In this situation monitoring of hemodialysis patients for HCV, HBV and other infectious marker transmitted is important to reduce infectious disease among hemodialysis patients, to prevent nosocomial infection and infections of medical staff.

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