

## PREVALENCE OF HEPATITIS C VIRUS (HCV) INFECTION IN HAEMODIALYSIS UNITS

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### Abstract

**Background.** Patients undergoing maintenance haemodialysis have a significantly higher prevalence of hepatitis C virus (HCV) infection. In the present study we determine the prevalence of HCV infection in haemodialysis units in Albania.

**Methods.** Recently we tested 557 patients undergoing chronic haemodialysis in 5 units.

They were screened for anti-HCV antibodies using third-generation tests.

**Results.** Testing for HCV antibodies identified 208 patients with anti-HCV antibodies giving a prevalence of 37%. We demonstrated that anti-HCV status was linked to the time on haemodialysis provided the nosocomial transmission of hepatitis C virus infection, whereas erythropoietin therapy and dialysis in dedicated places seem to protect against HCV infection.

**Conclusion.** This prevalence emphasizes the importance of adhering to the recommended universal infection-control precautions.

**Keywords.** Hepatitis C virus infection, chronic haemodialysis, prevalence.

### Introduction

Haemodialysis (HD) patients are recognized as a high risk group for hepatitis C infection than the general population. Prevalence of HCV infection varies greatly, from < 5% to nearly 60% according to different areas of the world (1). The prevalence of anti-HCV positive is currently below 10% in most but not all countries, very high > 20% rates are still observed in

association with societal crisis, war or poor economic status. The dialysis-related risk is independent and is known (around 2%/year) (2,3).

The understanding of the routes of transmission in HD has improved. There are two routes: transfusional and nosocomial transmission. With the rapidly improving sensitivity of screening of blood donors, as well as the widespread availability of erythropoiesis-stimulating agents (ESA) in the early 1990's, the role of transfusions in the transmission of HCV to HD patients dramatically decreased (4). Nosocomial route of transmission plays the key role in HCV transmission.

Although several studies have indicated that the incidence of HCV infection in chronic haemodialysis patients has decreased (5,13), HCV transmission in haemodialysis still occurs and is sometimes responsible for large outbreaks (6,7, and 8). It is important to diagnose HCV in haemodialysis patients early and accurately to prevent transmission and to ensure the appropriate management of the infection.

A lot of evidence indicates different modes of nosocomial HCV transmission in a haemodialysis unit. Several reports have suggested that HCV transmission is linked to breaches of standard precautions, leading to contamination of hands and the environment (9). The possibility of HCV transmission between patients through dialysis machines which is still controversial cannot be excluded. Sartor et al. provided evidence for HCV transmission between 2 patients sharing the same machine (10).

### Materials and methods

A total of 557 patients receiving chronic haemodialysis in 5 units (American Hospital, University and Hospital Center "Nene Tereza", Tirana, Regional Hospital of Shkodra, Elbasan, Gjirokastra). All patients who provided informed consent were on maintenance haemodialysis and were >18 years old for terminal chronic kidney failure. Patients undergoing chronic peritoneal dialysis were excluded. On the day of inclusion blood was collected before the haemodialysis session.

### Bioclinical data

Age, gender, hepatitis B surface antigen (HBsAg), anti-HCV antibody, haemodialysis vintage, the use of erythropoiesis agents, alcohol consumption, dedicated space for anti-HCV-positive patients.

### Results & Statistical analyses

There are 557 patients from 5 haemodialysis units. 208 are with anti-HCV positive.

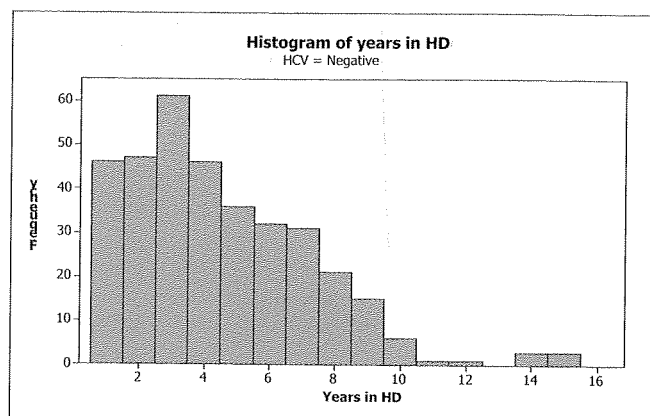
**Table nr.1. Shows the characteristics of patients, based on mean age, mean years of haemodialysis duration, sex and the prevalence**

	Number	Age Mean $\pm$ SD	Pozitive	Prevalence
Patients total	557	48.0 $\pm$ 15.2	208	37.3%
Female	198	50.6 $\pm$ 14.8	71	35.9%
Male	359	46.6 $\pm$ 15.3	137	38.2%
		Years in HD		
Patients total	557	4.9 $\pm$ 3.1		
Female	198	4.8 $\pm$ 3.1		
Male	359	5.0 $\pm$ 3.0		

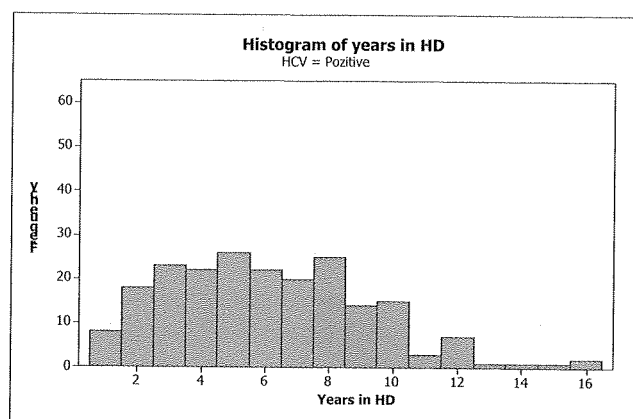
The mean age of all patients undergoing haemodialysis process was  $48.0 \pm 15.2$  years, for men patients was  $46.6 \pm 15.3$  for women was  $50.6 \pm 14.8$  years.

The results showed that prevalence in men 38.2% was a little bit higher than in women 35.9%.

The mean period of haemodialysis for the patients taking part in study was  $4.9 \pm 3.1$  years (for men duration was  $5.0 \pm 3.0$  years for women  $4.8 \pm 3.1$  years).



a



b

**Figure nr.1. (a,b)**

In figure nr.1 are shown the frequencies of patients with the duration of haemodialysis. In the negative cases (figure 1.a) predominated the frequencies with less than 6 years in haemodialysis, in positive cases (figure nr.1b) predominated the

frequencies with the 3 to 8 years in haemodialysis.

The probit analyses figure nr.2 a,b show that the prevalence is lowered with the age and is augmented with the duration in years of haemodialysis.

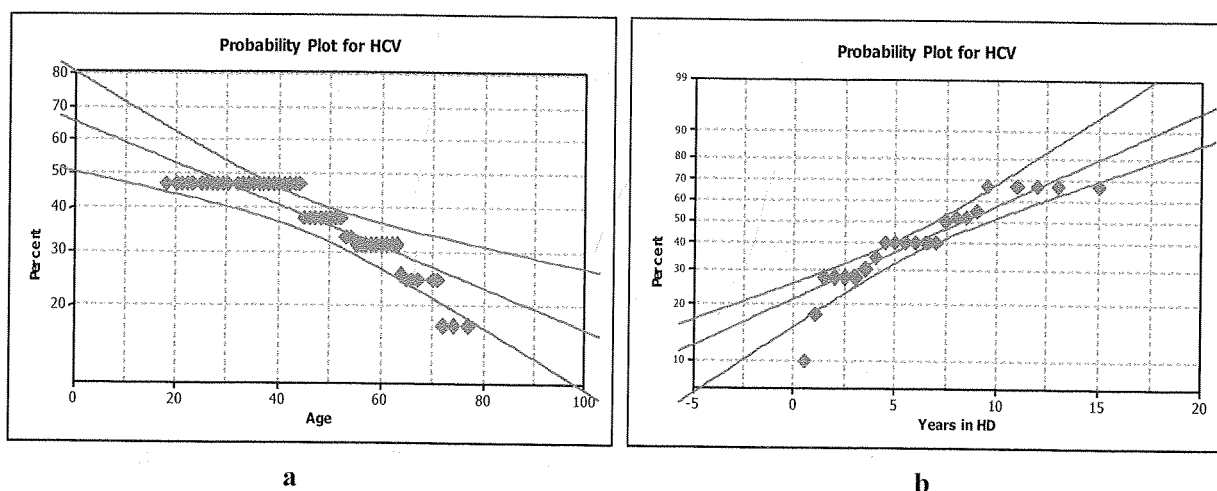


Figure nr.2. a. Probit analyses for age and b. Probit analyses for duration of haemodialysis

**Prevalence of HCV.** Anti-HCV antibodies were detected in 208 patients from 557 undergoing chronic haemodialysis. The

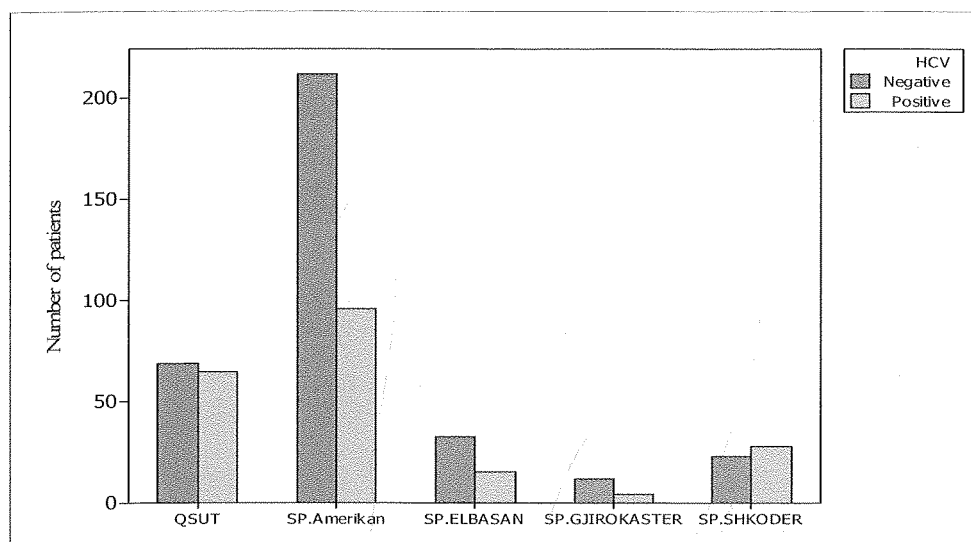
prevalence is 37%. The prevalence varied between centers from 25%-54%.

Table nr.2

	QSUT	American H.	Elbasan H.	Gjirokaster H.	Shkodra H.
Negative	69	212	33	12	23
Positive	65	96	15	4	28
Total	134	308	48	16	51
Prevalence	48.5%	31.2%	31.3%	25%	54.9%

From all centres of HD the biggest number of patients was registered in American Hospital 308 patients and the smallest number in Gjirokastra hospital. The smallest prevalence was registered in Gjirokastra

hospital with 25% and the biggest prevalence was registered in Shkodra hospital with 54.9%. Figure nr.3 shows the number of negative and positive patients in all centres of HD.



**Figure nr.3. Correlation between HCV and bioclinical data**

HCV status was linked with long-term dialysis, young age, gender (male).

### Discussion

Kidney Disease Improving Global Outcomes (KDIGO) decided to include HCV infection as an important topic to develop in nephrology, dialysis and transplantation and published: KDIGO clinical practice guidelines for the prevention, diagnosis, evaluation and treatment of hepatitis C in chronic kidney disease (11). They recommend that patients on haemodialysis be routinely monitored every 6-12 months for anti-HCV antibodies.

DOPPS (The Dialysis Outcomes and Practice Patterns Study) is an international prospective cohort study of haemodialysis treatment and patient's outcomes. There are 43828 patients in 12 countries tested between 1996-2011. The prevalence of hepatitis C in HD patients is 9.7%.

In our study the low prevalence is linked with separated haemodialysis for HCV-positive patients (Regional Hospital of Gjirokastra, Regional Hospital of Elbasan) and with the new center (since 2010), short time on HD, in American Hospital. The high prevalence is linked with not having strict universal precaution (UP) and the older center, long time HD (University and Hospital Center "Nene Tereza" Tirana, Regional Hospital of Shkodra). Universal precautions implementation involves

additional costs, knowledge about UP and commitment to adhere onto it. All the three factors with variable degree may be responsible for not having strict UP in place in dialysis units.

We find that the time on dialysis (dialysis vintage) is associated with the high risk of infection reflecting the cumulative risk of infection over time and the immunosuppressive effects of prolonged haemodialysis (12).

A few patients probably had been infected in the past as a result of blood transfusions before the screening of blood donors. Most of patients had been infected by nosocomial transmission (13).

The use of ESA therapy during last years was protective against anti-HCV antibodies.

The results showed that the prevalence in man was higher than in woman. This may be explained with alcohol consumption, unsafe behavior in a few cases.

The correlation between HCV and HBV status is uncertain. Haemodialysis patients have been vaccinated against HBV infection for the last few years so the association reflects past exposure to both viruses before secure haemodialysis were introduced (14).

### Conclusion

The high prevalence of HCV in our units in Albania emphasis the need to implement in haemodialysis facilities infection control

practices and aseptic techniques. If a unit is not able to contain HCV infection, then they must adopt isolation of HCV-positive patients in a separate room.

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