

Research on Prevalence of Viral Hepatitis C in Hemodialysis of the Casablanca-Settat Region

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ABSTRACT

Viral Hepatitis C remains the primary viral infection in chronic hemodialysis (HDC). It is a public health problem in this population because of its high prevalence firstly, and secondly, sound may become chronic and develop cirrhosis and hepatocellular carcinoma.

The objective of this study was to evaluate the prevalence of viral Hepatitis C, determine the epidemiological factors related to the infection, and the proportion of patients.

Methods: This is a retrospective, descriptive, analytical and collaborative epidemiological, conducted among chronic hemodialysis patients in the region Casablanca-Settat. Operating a listing has been sent to all centers in the region.

Results: Of the 80 regional dialysis centers, 14 centers have responded favourably to our request, with a total of 1406 patients included. 34.28% of the liberal sector, 21.3% public and 44% of the association. The average age is 54.4 years (13-97 years) with a slight male predominance 52.2%. The prevalence of HCV antibody-positive 6.4%. In patients infected with HCV median duration of hemodialysis is 8 years. The most dominant genotypes are G1 in 47.3% and 49.1% in G2. The median duration of hemodialysis is 8 years.

There is no significant difference between HCV+ patients and HVC patients for age, sex, transfusion and the number of blood units transfused. In addition, the median duration hemodialysis and the number of popular hemodialysis centers are significantly higher in the group of HCV+ patients ($p < 0.01$). While no risk factors have been implicated in the infection with hepatitis B ($p = NS$).

It should be noted that only 17 HCV+ patients were treated with HCV RNA undetectable after treatment.

Conclusion: The prevalence of HCV in hemodialysis is in gradual decline. The new direct-acting antivirals with the possibility of their support as well by mutual by hospitals can expect the eradication of viral hepatitis C in hemodialysis.

Keywords: Hemodialysis; Hepatitis C; Prevalence; Antibody

INTRODUCTION

Hepatitis is an inflammation of the liver, most commonly caused by a viral infection. There are five main hepatitis viruses, called A, B, C, D, and E. Hepatitis B and C are a real public health problem globally and nationally. The World Health Organization (WHO) estimates that about 3% of the general population is infected with HCV virus with 71 million chronic carriers [1,2].

The prevalence of HCV infection is much higher in patients undergoing hemodialysis than in the general population and is associated with these patients, with higher mortality compared with non-infected dialysis [2-4]. HCV infection prevalence among chronic hemodialysis patients can reach 80%, the impact is more than 9% annually [3,5]. This prevalence decreased since the introduction of several preventive measures: systematic screening of blood products, the use of erythropoietin and respect for hospital hygiene.

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In Morocco, it is estimated that the prevalence of viral Hepatitis C in hemodialysis is 32% according to the National Register dialysis graft Morocco "MAGREDIAL". However, this rate varies according to the centers ranging from 11 to more than 85% [4,6].

In view of a possible eradication of viral hepatitis in the population dialyzed in the area of Casablanca Settat, including HVC with the advent of new Direct-Acting Antivirals (DAA), a reassessment of the exact prevalence s 'required to determine the need for these new treatments and substantial budgets.

MATERIALS AND METHODS

This is an analytical and collaborative epidemiological retrospective descriptive study over a period of 12 months (01/10/2016-30/09/2017), conducted in the hemodialysis centers in Greater Casablanca-Settat.

RESULTS

General characteristics of the study population

Of the 80 dialysis centers in the region Casablanca Settat, 14 centers have responded positively to our request or 17.5%.

In 7763 chronic hemodialysis patients in the region, 1,406 patients were included in our study is 18.11%. These patients belong to the three sectors: public, liberal and associative. The average age of patients was 54.4 ± 15 years, ranging from 13 to 97 years, with a slight male predominance 52.2%. The seniority of the periodic hemodialysis treatment in our patients varies from 6 months to 32 years, with an average of 6 years; it exceeds 7 years in 41% of cases.

The initial nephropathy was diabetic nephropathy in 24.1%, 19.1% in vascular, glomerular in 13.9%, chronic pyelonephritis in 3.6% and polycystic kidney disease in 4.1%. In 33.1% of patients, the cause remained undetermined (Figure 1).

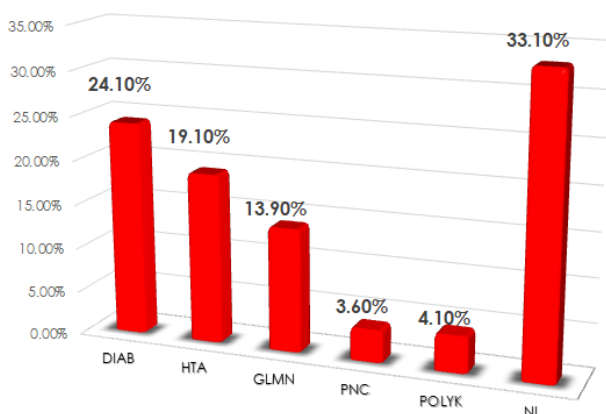


Figure 1: Distribution of patients undergoing hemodialysis study subjects according to initial nephropathy.

HVC+ population characteristics

The overall seroprevalence of HCV calculated from the results of serology and PCR of viral hepatitis C obtained for all

participating patients in the study were 90 patients in 1406 is 6.4%.

The seroprevalence rates varied considerably from one center to another, ranging from 0% to 31.7%.

In our study, only one patient had clinical symptoms related to an infringement liver, whereas in the majority of our patients the discovery was fortuitous as part of systematic serological surveillance report.

Genotyping was performed in 55 patients with HCV or 61.1%:

- 26 patients or 47.3% were carriers of genotype 1
- 27malades or 49.1% were carriers of genotype 2
- 1 patient is 1.8% was genotype carrier 3
- 1 patient was either 1.8% genotype 4 carrier

The average age in the group of patients with the virus HCV is 52.11 years (+ or -14.4) with extremes ranging from 24 to 87 years, and a slight male predominance, 46 men is 51.1% against 44 women or 48.9%.

The initial nephropathy in HCV+ patients was undetermined in 26.7% of cases, 23.3% in diabetic, hypertensive in 22.2% of glomerular origin in 22.2% and due to polycystic kidney disease in 5.6% of cases.

The seniority of the periodic hemodialysis therapy in our HCV+ patients ranged from 1 year to 20 years with an average of 8 years.

The patients in our study were classified into three groups according to the number of years of dialysis. Table 1 illustrates the prevalence of infection with Hepatitis C by seniority hemodialysis. The prevalence of HCV increased from 7% for those with less than 2 years of age to 25% in those treated for more than 2 years and less than 5 years, 68% after 5 years of 60% HCV+ patients attended between 2 and 3 hemodialysis centers. Table 2 shows the percentage of HCV+ patients according to the number of centers frequented.

Table 1: Seniority in hemodialysis and HCV infection.

Seniority of dialysis (year)	<2	02-05	>5
Patients HVC+	7%	25%	68%

Table 2: The number of busy center and HCV infection.

Number of centers attended	1	2	3	4	5
Patients HVC+	22%	40%	20%	8%	10%

81.8% HCV+ patients had arteriovenous fistula as venous vascular access, 14.8% of patients were on dialysis catheter and 3.4% on the prosthesis. 45.5% of patients were on dialysis two times a week while 54.5% were receiving dialysis three times a week.

Among 90 patients HCV+:

- 65% of patients had a history of blood transfusion, the number of packed red blood cell transfusion varies from 2 to 10 CG CG with an average of 2.6 ± 1.7
- 33% of the cases had received dental care
- 37% of cases had been operated before beginning dialysis
- 20% of patients had unprotected sex
- There were no similar cases in the families of our patients

Overall, in this study, two groups of hemodialysis patients were compared: those with HCV serology+ (90 patients) and those with HVC serology (1316 patients). Univariate analysis of factors that may be associated with HCV infection allowed us to objectify both of which were related statistically significant, namely seniority in hemodialysis and the number of centers frequented (Table 3).

Table 3: Risk factors of HCV in the population studied in univariate analysis.

Features	HVC+		HVC-	
	Features	p	Features	p
Age (Year)	52, 11 (+ou-14, 4)	0.4	54, 79	0.45
Sex				
Male (%)	-52%	0.3	53%	0.39
Female (%)	-48%		47%	
Seniority in hemodialysis (year)	8 ans	<0.01	6 ans	0.1
Vascular surroundings				
FAV (%)	-81, 8%		-94, 6%	
Catheter (%)	-14, 8%	1	-4%	1.2
Prosthesis	-3, 4%		-1, 4%	
Rhythm of the sessions				
-2 sessions/sem (%)	-45, 5%	0.9	-43%	0.8
-3 sessions/sem (%)	-54, 5%		-57%	
Number of centers attended	2à3	<0.01	1à2	0.2
Transfusion (%)	65%	0.2	56%	0.18
Number of red cells	2à6	0.23	2à3	0.8
Surgery (%)	37%	0.3	17%	0.2
dental care	33%	0.5	24%	0.4

sex	20%	1	14%	1
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Treatment of viral hepatitis C in chronic hemodialysis patients

Among the 90 patients HCV+, 17 patients (20%) received antiviral treatment for moderate to severe viral hepatitis.

Therapeutic abstinence with clinical and laboratory monitoring every 6 months, had been considered in 44 patients (52%):

- 12 patients with normal transaminases viral Hepatitis and minimal histological lesions
- 32 patients for lack of means

While 29 patients, laboratory tests were underway. 17 patients in our series were completely for antiviral treatment.

The results at the end of treatment in these patients were good, defined a sustained viral response (RVS absence of viral RNA in the blood) in 100% of cases.

DISCUSSION

Infection with HCV is a real public health problem worldwide. In 2018, WHO estimated that 3% of the world population was infected with this virus and that 71 million people are chronic carriers of Hepatitis C.

Several studies have been conducted in Morocco to identify the seroprevalence of Hepatitis C in HDC. They objectified prevalences ranging from 18.4 to 79% (Figure 2).

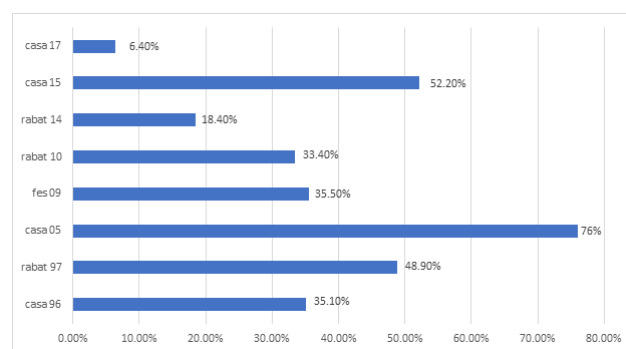


Figure 2: Prevalence of HCV according to Moroccan studies since 1996.

It is found that the prevalence found in our study is the lowest of all those published so far on the seroprevalence of HCV among HDC Morocco. It is less than that described by the Moroccan register Magredial, and other studies nationally 35.5% in Fez in 2009, 33.4% in the Rabat-salt region, Khmisset, and Meknes in 2010 and 18.4% to flap in 2014 [7-13]. But these prevalence figures remain higher compared to the general population of Morocco, where the prevalence of HCV is estimated at 1.58% and the population of blood donors where it is 0.62% according to the study of Baha et al. in 2013 [14].

At the global level, HCV prevalence among patients with chronic renal failure is much higher than in the general population, from 10% to 50% by geographic area [15] (Eg 7% to 40% in developed countries [16] and 3% to 20% in Western

Europe [17]. Recently, Goodkin and Bieber [18]. International described the prevalence of HCV in hemodialysis patients waiting for transplants. In the DOPPS database (Dialysis Outcome and Practice Patterns Study), this prevalence varied from 0 in China and France to 4.8% in the US and 11% in the countries of the Gulf Cooperation Council. More recent international studies have reported prevalences following (Figure 3).

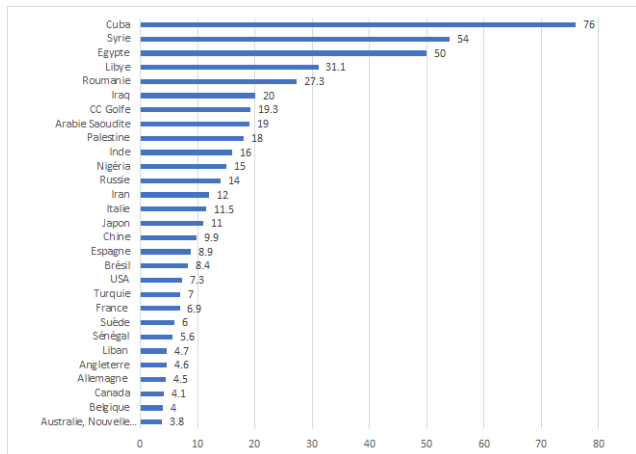


Figure 3: The prevalence of HCV in hemodialysis according to recent studies [19].

Subject to an accurate census of the HCV+ population studied, the low prevalence found could be explained by:

- Serological screening of anti-HCV in blood donors, established since 1994
- The use of EPO to treat anemia secondary to renal failure instead of blood transfusions
- Respect for universal hygiene rules
- The treatment anti-HVC increasingly prescribed

Several factors have been implicated in the prevalence of HCV, but the most commonly cited are transfusion and duration of hemodialysis [6]. Other factors have been highlighted by the DOPPS multicentre [5]. According to this study, the prevalence of HCV increases with the number of years of hemodialysis, male sex, diabetes, black race, HVB, and alcohol abuse. In our series, neither gender nor diabetes nor HBV infection accounted for HCV risk factors.

At our study blood transfusion history was noted in both groups of patients HCV+ and HCV- with a frequency of 65% in patients with viral hepatitis C, against 56% in the uninfected group but no significant difference. This could be explained by the decline in use of transfusions as treatment of anaemia, since EPO is used in Morocco in the early two miles [5].

Many studies in which DOPPS has demonstrated the positive link between the prevalence of HCV and seniority hemodialysis worldwide. Dussol confirms this in a multicenter study conducted in the South East of France. Where He concluded that the duration of dialysis beyond eight years is the main risk factor for infection by HCV [2].

In our study, the number of hemodialysis years is a risk factor for HCV and the number of busy center.

The number of busiest centers is an important risk factor. A study at Aden in Yemen in 2015 by Aman et al showed that the prevalence of HCV infection among HDC was significantly associated with the number of hemodialysis centers frequented by univariate and multivariate analysis [20], in this study over 63.3% of HCV+ patients had attended more than a hemodialysis center. This is consistent with other studies [21]. In our work the number of centers frequented stands as a risk factor ($p < 0.01$).

This finding is explained by the non-compliance with the recommendations suggesting to detect infection with HCV in all patients at the beginning of the hemodialysis center or when transferring from another dialysis center or modality [19]. Identification of HCV transmission in a dialysis center should prompt immediately reassess infection control practices and determine the appropriate corrective action.

Lately, the treatment of Hepatitis C has progressed with the development of new antiviral molecules specifically targeting viral proteins: antivirals Direct Action (ADA).

Studies interested in this topic are still rare, according to those available we can notice that the treatment of HCV by regimes sofosbuvir associating with another direct antiviral agent including Daclatasvir gave good results with SVR from 75% to 100% tolerance to these direct antiviral was also better compared to protocols involving ribavirin or pegylated interferon.

The new recommendations emphasize KDIGO 2018 regimens without sofosbuvir and recommend the following treatment options:

- Grazoprevir+Elbasvir for 12 weeks for genotype 1
- Glécaprevir+Pibrentasvir for 12 weeks

In our study 7 patients underwent this treatment, the results were surprising and reassuring with negativity in viral load at 4 weeks in all patients and sustained virologic response (SVR) 12 weeks at 100%, tolerance was also very good. In our patient series showed no severe adverse events and no treatment has stopped.

CONCLUSION

The prevalence of HCV among Moroccan hemodialysis is in gradual decline, and long transfusion offending factor gradually loses its importance. By cons, seniority in hemodialysis and the number of hemodialysis centers frequented appears to be a contributory factor. The respect of hygiene and rigorous implementation of the recommendations of prevention against the transmission of HCV could further improve the prevalence of Hepatitis C in dialysis units.

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