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RESEARCH ARTICLE

Seroprevalence of Hepatitis B in Hemodialysis Patients and Associated Factors in N'Djamena

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Abstract

Introduction: Hepatitis B virus infection is a real public health problem worldwide, with around two billion people infected and 257 million chronic carriers. The lack of data on chronic hemodialysis patients in N'Djamena prompted this study, the aim of which was to improve the management of viral hepatitis B in chronic hemodialysis patients at the Centre Hospitalier Universitaire -Référence Nationale and the Centre Hospitalier Universitaire -Renaissance in N'Djamena.

Material and Methods: This was a descriptive cross-sectional study spread over a period of 8 years and 8months from March 2014 to November 2022. The variables described were sociodemographic, clinical and paraclinical.

Results: The prevalence of hepatitis B virus infection among chronic hemodialysis patients was 12.7%, with a male predominance and an M/F sex ratio of 1.6. The average age was 49. Seven patients were between 40 and 60 years old. Most patients were from urban areas. There were 10 married patients in this study. Eight patients were HBsAg-positive before starting dialysis. Four patients had been on dialysis for less than 2 years. However, 6 patients had been on dialysis for two to four years (2-4years). Transaminase levels were normal in 9 patients. Twelve patients had received at least one blood transfusion.

Conclusion: Hepatitis B virus infection is common in chronic hemodialysis patients, who are fragile and often polytransfused.

Keywords: HBV, Hemodialysis, Infection, atients, Chad.

1. Introduction

Viral hepatitis is a systemic infection that preferentially affects the liver, causing inflammatory lesions and degenerative hepatocyte changes that can, in some cases, lead to fibrosis or even cirrhosis [1]. Five viruses responsible for viral hepatitis have been identified: virus A, virus B, virus C, virus D (delta), virus E. All can cause acute hepatitis. Viruses B, D (associated with B) and C can cause chronic hepatitis, which can be complicated by cirrhosis and/or Primary Liver Cancer (PLC) [1]. Hepatitis B virus (HBV) infection is a major public health problem worldwide, with around two billion people infected and 257 million chronic carriers.In Africa and Asia, the prevalence of chronic hepatitis B is high, ranging from 8% to 26% [2].

Hepatotropic viral infections (particularly HBV) are more common in dialysis and kidney transplant patients than in the general population. Their mode of transmission is secondary to blood transfusion, nosocomial in hemodialysis centers and sometimes secondary to transplantation of an infected kidney graft [3].

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The prevalence of HBsAg in hemodialysis patients varies from 1.6% to 15% in industrialized countries[4].

In Africa, prevalence varies.

In Benin, a 2018 study found a prevalence of 39% among haemodialysis patients [5].

In Burkina Faso, a prevalence of 12.2% has been reported in the Nephrology department of the teaching Hospital Yalgado Ouedraogo [6]

In Chad, although the prevalence of hepatitis B is high at national level, to our knowledge no study has been carried out among haemodialysis patients, hence the interest of this study.

2. Patients and Methods

This was a descriptive, retrospective cross-sectional study spread over 8 years and 8 months (March 2014 to November 2022). The Nephrology and Gastroenterology/Internal Medicine departments of the Centre Hospitalier Universitaire - la Reference Nationale (CHU-RN) and the Nephrology department of the Centre Hospitalier Universitaire - la Renaissance (CHU-R) in N'Djamena served as settings.

The study population consisted of patients aged 18 and over with chronic hemodialysis, followed in one of the two University Hospitals. Hemodialysis patients who had been monitored for more than 3 months and screened for hepatitis B were included.

Non-consenting chronic hemodialysis patients not screened for HBV were not included.

The variables used were epidemiological, sociodemographic, paraclinical and therapeutic.

3. Methods

Screening for hepatitis B was performed using the rapid diagnostic test. Positive cases were confirmed by a second test and then referred to the Gastroenterology Department's Hepatology Unit, where a complementary pre-therapeutic work-up was carried out, including biology, imaging and PCR testing for possible treatment.

The dialysis technique used was conventional and continuous, with two sessions per week. Bicarbonate was used for the dialysis bath.

3.1 Defining operational variables

» Chronic viral hepatitis: according to the French National Authority for Health (HAS), chronic infection is defined by the persistence of HBsAg beyond six months [7].

» CKD: defined as renal disease that has been evolving for more than three months, it

can be confirmed by anamnestic, morphological and biological criteria in the case of CKD [8].

3.2 Data analysis and processing

» Data were entered using Word and Excel. Data were analyzed using SPSS V26 software.

4. Results

4.1 Prevalence

Out of a total of 102 patients included in the study, 13 were hepatitis B carriers (HBsAg positive), i.e. a prevalence of 12.7%. Males predominated in this series: 8 males for 5 females, i.e. a sex ratio of 1.6. Most patients were from urban areas (77% of cases). Ten were married. Socioeconomic status was considered average in 7 patients in this series.

4 patients had been on dialysis for less than 2 years. Patients on dialysis for two to four years (2-4 years) accounted for almost half (6/13), and those on dialysis for more than 4 years for almost a third (3/13).

Concerning the circumstances of discovery of hepatitis B, 8 of the 13 patients were carriers of the virus before the start of dialysis sessions. The other 5 patients were probably infected during dialysis sessions, including two before 2 years and three after two dialysis sessions.

Biologically, transaminases were normal in 9 of 13 patients. Almost all patients (12/13) had received a blood transfusion.

Table 1. *Breakdown by socio-demographic characteristics*

	Workforce	Percentage
Age (year)		
[18-40]	3	23,1
[40-60]	7	53,8
> 60 Gender	3	23,1
Male	8	61,5
Female	5	38,5

Marital status		
Married	10	76,9
Single	1	7,7
Divorced	0	0
Widowed	2	15,3
Socio-economic level		
Bottom	3	23
Medium	7	54
High	3	23

5. Discussion

In this series, the prevalence of hepatitis B in dialysis patients was 12.7%. This rate is in line with the literature, which classifies most sub-Saharan countries, including Chad, in the so-called high-prevalence zones. Viral hepatitis B thus constitutes a major public health problem in our country [9]. This result is lower than those of Besimbaye et al. for HIV-infected patients in Chad [10].

When it comes to hepatitis B infection, all social strata, regardless of sex or age, can be affected. Dialysis patients, for example, are not spared, and are even more at risk than the general population, since they represent a fragile segment of the population that is often transfused.

In industrialized countries, chronic HBsAg carriage in hemodialysis patients is low, as in the general population [4]. However, a recrudescence of B viral infection has been observed in dialysis centers. This is justified by the fact that chronic hemodialysis patients constitute a high-risk population. In North Africa, a prevalence of 2% has been reported by Kawtar [11].

This present prevalence of 12.7% in our series is comparable to data in the literature: Bonzi et al. in Burkina Faso and 2021 and Teles et al. in Brazil found 12.2% and 12% respectively [6,12].

On the other hand, this prevalence is significantly higher than that found by Lemrabott et al. in Senegal in 2016, who found a prevalence of hepatitis B among chronic hemodialysis patients of 6.3% [13].

This low prevalence of HBV among chronic hemodialysis patients in these series would be related to the introduction of systematic HBsAg screening among blood donors, as well as the systematic vaccination of all hemodialysis patients prior to the initiation of dialysis.

In our context, although screening is systematic before blood donation, vaccination prior to dialysis is not practised.The average age of the patients was 49, with extremes of 18 and 80. The 40-60 age group accounted for over 53%. This result is close to the Senegalese series by Lemrabott et al. in 2016, who found a mean age of 47.1 ± 14.8 years [11]. This average age, close to that of the Senegalese study, is in line with the reality of the African literature, which shows a relatively young population. In terms of gender, 63.7% of cases were predominantly male, with an M/F sex ratio of

1.6. Conversely, in Lemrabott's series, the sex ratio was equal to 1, i.e. in this series, there are as many women as men [11].

As regards the circumstances of hepatitis virus contamination in this study, 8/13 of patients were HBsAg positive before the start of dialysis, compared with 5/13 who contracted hepatitis B virus after the start of dialysis, or at least would have been diagnosed after the start of dialysis.

The mode of contamination with the hepatitis B virus after the start of dialysis would be linked to poor sterilization of the hemodialysis machine used by a patient carrying the HBV, or to a transfusion of blood infected with the said virus, or to the inappropriate use of thermolabile multiple-use medical devices (non-sterilizable devices, so their use must be restricted exclusively either to uninfected patients or to patients carrying the hepatitis B virus).

The notion of blood transfusion is found in 12/13. Although blood safety measures have been reinforced in recent years, there is no such thing as zero risk when it comes to blood transfusions. Consequently, she would probably have contributed to the contamination of the 5 patients contaminated after the start of the dialysis sessions.

Repeated dialysis sessions, even if necessary for patient survival, are a risk factor. Biologically, transaminase levels were normal in 9/13 patients. As the hepatitis B virus has a hepatic tropism, after contamination it tends to infect the hepatocytes, thus impairing their function. This deterioration is reflected in an increase in transaminases, particularly ALAT, especially in the acute phase. In our series, most cases were chronic infections, hence the high levels of normal transaminase.

6. Conclusion

The prevalence of hepatitis B virus infection in our series is high in chronic hemodialysis patients. In order to reduce the prevalence of this viral infection among chronic hemodialysis patients, prevention remains the best course of action. Systematic screening of blood and organ donors should therefore be introduced and reinforced. Compliance with universal hygiene measures and systematic HBsAg screening of chronic hemodialysis patients prior to any hemodialysis session and during follow-up check-ups are strongly recommended. To this end, we suggest screening patients and vaccinating negative cases with chronic renal failure.

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