



## **Hepatitis B Virus Infection among Chronic Renal Failure Predialysis Patients in Hodiedah, Yemen: Retrospective Study**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author MSA did the study design and wrote the manuscript. Author MAAK did the statistical analysis and contributed in revision of the manuscript. Author MAA collected the data. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Background:** Hepatitis viruses cause problems at almost all the stages of chronic renal failure (CRF). Most of hepatitis B virus (HBV) infected patients live in developing countries with infections rate varying from country to country.

**Objective:** This study aimed to find prevalence of HBV in renal failure pre- dialysis patients in renal

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dialysis center of Hodiedah city, Yemen.

**Methods:** Demographic data of 278 patients was collected retrospectively for four years and eight months from January 2011 to September 2015. All patients were examined for hepatitis B surface antigen (HBsAg) using one-step cassette device. Positive samples were confirmed by enzyme linked immunosorbent assay (ELISA). Demographic data of patients was recorded namely sex, age, education, accommodation and working.

**Results:** Out of 278 patients, 10 cases (3.60%) were found having HBV infection. Out of 10 positive patients, 7 cases (4.14%) were males and 3 cases (2.75%) were female. Prevalence of HBV was found in the 41- 60 age group (4.39 %) followed by 21-40 age group (3.85%). HBV was detected in 6 cases (4.72%) of 127 urban residence patients and in 4 cases (2.65%) of 151 rural residence patients. Prevalence of HBV was showed similar among educated and non-educated subjects (5 cases for each). There was a main distribution of positive cases in non-working population (10/252=3.97%) as compared to working population (0/26=0.00%).

**Conclusion:** HBV was detected in few CRF predialytic patients namely 3.60%. Screening of HBV in CRF predialytic patients is an effective strategy taken to ensure containment of hospital acquired infection (HAI) by isolation of patients in certain machines.

*Keywords: HBV; renal; chronic; failure; Yemen.*

## 1. INTRODUCTION

Chronic renal failure (CRF) patients with haemodialysis are at increased risk for transmission of Hepatitis B virus (HBV) infection. In dialysis environment, HBV transmits by transfusion of contaminated blood and blood product, exposure to contaminated equipment [1-4] and contact with infected patients and health staff [5]. HBV infection is very serious public health problem. Worldwide, 2 billion people exposed to infection and 350 million with chronic HBV infection. The World Health Organization estimated that 500,000 to 1.2 million death each year due to HBV-related chronic liver disease [6,7].

HBV is a small double stranded circular DNA virus of about 3.2 kilo base (kb) pairs. HBV belongs to Hepadnaviridae family with exceptional similar features to retroviruses [8]. Developing countries have a high prevalence of HBV infection [9,10] that explained by non-knowledge about the universal infection control procedures [11]. In Yemen, earlier studies were demonstrated that prevalence of HBV chronic infection in different Yemeni cities ranges from 1.8% to 34% [12-15].

There is insufficient data on prevalence of HBV infection in the CRF population without renal replacement therapy or during predialysis period [16-18]. Therefore, present study was aimed to find prevalence of HBV in CRF patients who admitted to our dialysis center for hemodialysis for the first time (pre-dialysis stage) in renal dialysis center of Hodiedah city, Yemen.

## 2. METHODS

### 2.1 Study Area and Design

Our study is an observational analytic study with collection of a retrospective data from patients' medical handbooks. This study was carried out in dialysis center in Hodiedah city in western of Yemen. Demographic data of 278 CRF predialytic patients was collected for four years and eight months from January 2011 to September 2015.

### 2.2 Study Population

Demographic data was collected from CRF predialytic patients aged between 8 and 80 years. The studied population was stratified into male, female and four age groups. CRF population further was divided into two residence groups: urban and rural. According to stage of education, population was stratified into two educated and no educated group. In addition, population was divided to working and non-working group according to working.

### 2.3 Sample Analysis

All patients were screened for hepatitis B surface antigen by using one-step cassette style device as per instructions from the manufacturer (Rapid HBsAg Test, Intec, China). Positive samples were confirmed by enzyme linked immunosorbent assay (ELISA HBsAg, DRG, USA).

## 2.4 Data Analysis

Demographic and laboratory data was entered and analyzed using excel software 2010. The statistical methods used could not be applied for such small patient's subgroups (one or two patients in particular subgroup were infected with HBV). Therefore, we used descriptive analysis namely the percentage.

## 3. RESULTS

The general characteristics of patients and the obtained results are summarizing in Table 1. Out of 278 CRF patients, 10 cases (3.60%) were found having HBV infection. Out of these 10 HBV infected patients, 7 cases (4.14%) were males and 3 cases (2.75%) were females. 5 cases of 132 patients (3.85 %) and 5 cases of 114 patient (4.39%) were found in the 21- 40 and 41 - 60 age group respectively. No prevalence was observed in the age group of < 20 years and > 60 years. HBV was detected in 6 cases of 127 (4.72%) patients who were reported urban residence and in 4 cases of 151 (2.65%) patients who were reported rural residence. HBV infection was showed in 5 cases (3.85%) of 130 non-educated subjects and in 5 cases (3.38%) of 148 educated subjects. There was a main distribution of

positive cases in non-working population (10/252=3.97%) as compared to working population (0/26=0.00%).

## 4. DISCUSSION

Hepatitis viruses cause problems at almost all the stages of CRF. 95% of HBV infected patients live in developing countries with infection rates varying from country to country [19]. It is believed that hepatitis viruses are often found in patients especially in stage 3 to 5 of chronic renal disease due to various reasons such as transfusions, frequent contact with infected patients and health staff, dialysis with an infected machine, increased touching of contaminated material and poor response to HBV vaccine [20].

In present study, prevalence of HBV is 3.60% in studied population. In our country, there are no studies were performed on predialytic CRF patients. Thus, we think that recent study is unique in this area. Worldwide, few studies exist about prevalence HBV among CRF predialytic patients [21,22]. These studies mostly were carried out in the regions with a high prevalence of HBV [19,23]. Sit et al. [24] reported that prevalence of HBV in CRF Patients in the predialysis Stage at a University Hospital

**Table 1. Hepatitis B surface antigen (HBsAg) among studied patients**

Variable	Number	%	HBsAg (+)	
			No.	%
<b>Sex</b>				
Male	169	60.80	7	4.14
Female	109	39.20	3	2.75
Total	278	100	10	3.60
<b>Age</b>				
< 20 years	13	04.70	0	0
21 - 40	130	46.80	5	3.85
41 - 60	114	41.00	5	4.39
> 60 years	21	07.60	0	0
Total	278	100	10	3.60
<b>Accommodation</b>				
Rural	151	54.32	4	2.65
Urban	127	45.70	6	4.72
Total	278	100	10	3.60
<b>Education</b>				
Educated	148	53.24	5	3.38
Non educated	130	46.80	5	3.85
Total	278	100	10	3.60
<b>Working</b>				
Working	26	09.35	0	0
Non-working	252	91.64	10	3.97
Total	278	100	10	3.60

in Turkey is 10.5% (HBsAg), 36.8% (anti-HBc), 28.7% (anti- HBs), 5.3% (HBeAg) and 32.7% (anti-HBe). Pişkinpaşa and his colleagues showed that [25] prevalence of HBV in CRF Patients without renal replacement therapy (predialysis) is 3.5%. López-Alcorocho and his colleagues also showed that [26] prevalence of HBV in CRF patients before entering into hemodialysis program is 2.8%. Our prevalence of HBV in predialytic CRF patients is lower than that found by Sit and et al. and nearly like to that found by Pişkinpaşa et al. and López-Alcorocho et al.

CRF Patients are high risk group for exposure to hepatitis viruses in dialysis units due to various reasons included; impairment of immune system, blood transfusions, using same machine and/or sharing the same room with infected patients, contact with infected health staff, disobeying universal rules and using immunosuppressive drugs [27,28]. Worldwide, many studies carried out to find prevalence of HBV in CRF patients during dialysis process. These studies were reported higher prevalence than our result. Differences between prevalence of HBV in CRF patients before dialysis process (predialysis period) and during dialysis may attribute to increase incidence with HBV in dialysis environment [27,28].

Hemodialysis units have experienced outbreaks of HBV infection with fatal cases among patients and staff. HBV prevalence varies from country to country and from one dialysis unit to another. In Yemen, few studies were reported that prevalence of HBV in CRF patients during hemodialysis is 12% in Mukalla city [29], 12.6% in Hodeidah city [30] and 48.83% in Zabeed city [31]. Many studies in other countries were reported that prevalence of HBV in CRF patients during hemodialysis is 0.9% in India [32], 5% in Sudan [33], 7% in Vietnam [34], 29.4% in Palestine [35], 14% in Albania [36], 7% in Jordan [37], 3.2% in Iran [38]. In present study, HBV was detected in few subjects namely in males (7 cases) and females (3 cases). On the other mean, HBV in CRF predialytic patients is less.

## 5. CONCLUSION

In conclusion, HBV was detected in few CRF predialytic patients namely 3.60%. HBV screening in CRF predialytic patients is an effective strategy taken to ensure containment of

hospital acquired infection (HAI) by isolation of CRF patients in certain machines.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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