



Research Article

Incidence of Hepatitis B Infection among People with Renal Failure in Babylon Province

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A B S T R A C T

Introduction: This study was performed in the Marjan Medical City/hemodialysis Center of Babylon province, Iraq from 1 February 2020 to 1 February 2021. It aimed to investigate the incidence of the hepatitis B virus in people with renal failure. The study included some factors such as virus type, seasons, gender, age group, and blood groups.

Methods: The reporting of all suspected HBV cases with renal failure in Marjan Medical City/ Haemodialysis Center in the Directorate General of Health (DGoH) of Babylon province/ Iraq from 1 February 2020 to 1 February 2021 were used in the current study.

Results: The results of this study showed that the total infection incidence in renal failure samples reached (16.67%) of 48 diseased cases that were monitored by the artificial kidney centre (hemodialysis) for people infected with the hepatitis B virus. The prevalence of this pattern was observed during the seasons of the year, where the infection incidence was higher in June and September, amounting to 61.11% and 36.39%, respectively, while males 17.42% recorded a higher incidence of infection than it is in females 15.45%. It was found that the infection rates varied. Among the different age groups (13-68 years), the highest infection rate was within the youth age group (11-20), (21-30), and (41-50) years old, which was 66.67%, 26.67%, and 25%, respectively.

Conclusion: Subjects with HBV demonstrated that O+ and unidentified blood groups had confirmed instances of HBV contrast to other blood groups with 39.58 per cent and 29 per cent, respectively.

Keywords: Hepatitis B, Province, Renal failure

Introduction

Hepatitis B is a world-threatening health problem that affects the liver significantly and is caused by the hepatitis B virus (HBV). This virus causes chronic infection and exposes

people with it to risk of death as a result of liver fibrosis and liver cancer such as HBV-associated membranous nephropathy (HBVMN).¹ Chronic liver disease (CLD) is associated with a decreased number of functional liver



cells. Therefore, it will reduce the effectiveness of drugs that undergo hepatic metabolism in CLD patients.² Most medications are known to be metabolized mainly by the cytochrome P450 (CYP).^{3-5,6} Several previous studies have demonstrated this differential effect of liver disease on CYP activity.^{5,7,8,9}

The virus particle which is a member of the *hepadnaviridae* family consists of an outer lipid envelope and a nucleocapsid core composed of a protein.¹⁰ It causes acute or chronic infection in humans with long and variable incubation times ranging from eight weeks to six months, acute infection can be characterized by the presence of surface antigen of HBV (HBsAg), secreted viral protein (HBeAg), and elevation of alanine and aspartate aminotransferase in serum, following this, there is the appearance of antibodies against core antigen of HBV (HBcAg) then HBeAg and HBsAg appeared in serum, which aids in the recovery of patient and clearance HBV infection, Acute infection remains asymptomatic in most patients, while another section of patients suffers from symptoms such as nausea and hepatitis is noted.¹¹ A recent study in Iraq by Hanash SH confirmed that a high prevalence of HBV infection was among middle-aged groups, and males were more than females with a ratio of (2.5: 1), A study conducted in Iraq on a group of university students showed that all of HBs Ag and HBe Ag were negative results while HBc Ab and HBe Ab were positive results, while HBs Ab only had three positive results from other samples.¹² The aim of this study was to follow up the epidemiology of this virus among people with renal failure in Babylon province under the light of environmental, health, and service changes in general, and given the lack of research and studies on the epidemiology of this virus specifically, the large number of patients admitted to hospitals, and the high wages of private clinics, medicines and health supplies for this disease, which led to a high incidence of infection. Therefore, the current study aimed to determine the incidence of hepatitis B virus among people with renal failure in Babylon province and to determine the causes.

Material and Method

Subjects

The reporting of all suspected HBV cases with renal failure

in Marjan Medical City, Haemodialysis Center in the Directorate General of Health (DGoH) of Babylon province, Iraq from 1 February 2020 to 1 February 2021 were used in the current study.

Criteria used in the Study

- The rate of infection with hepatitis B virus according to the months
- The rate of infection with hepatitis B virus according to sex
- The rate of infection with hepatitis B virus according to the age group
- The rate of infection with hepatitis B virus according to the blood group

Statistical Analysis

Statistical analysis was performed by using the percentage of criteria included in the study. Through collection surveillance data were entered into Microsoft Excel 2013 (Genuine Microsoft Office Software, Louisville, KY, USA). A set of multivariate binary logistic regression models was generated to calculate the infected ratios with the different variables investigated in the study for individuals having confirmed cases of HBV.

Results

A total of 288 cases of patients with renal failure in Marjan Medical City/ Haemodialysis Center in Babylon province/ Iraq were investigated for the incidence of the hepatitis B virus in people with renal failure from 1 February 2020 to 1 February 2021. Forty-eight cases were diagnosed as confirmed HBV in a laboratory. Tables 1-4 show the suspected and confirmed HBV cases by months, sex, age group, and blood groups. Knowing that all of the mentioned cases were of Iraqi nationality. Suspected cases varied widely in age from 13 years to 68 years, the age of confirmed cases ranged from 15 to 64 years.

Table 1 shows the percentage of infection according to the months of the year, the highest percentage was in June and September (61.11% and 39.39%, respectively), compared to the other months of the year which the percentage of infection ranged from (5.56-17.24)%.

Table 1. Suspected and Confirmed Cases of Hepatitis B Infection in Individuals Suffering from Renal Failure according to Months, Babylon Province/ Iraq, during the Year 2020-2021

S No	Months	Suspected Cases	Confirmed Cases	Infection Ratio (%)
1	February (2020)	20	2	10
2	March	29	5	17.24
3	April	11	1	9.09
4	May	25	3	12
5	June	18	11	61.11

6	July	17	2	11.77
7	August	25	2	8
8	September	33	13	39.39
9	October	14	1	7.14
10	November	26	2	7.69
11	December	18	1	5.56
12	January	30	2	6.67
13	February (2021)	22	3	13.64
Total		288	48	16.67

Table 2. Suspected and Confirmed Cases of Hepatitis B Infection in Individuals Suffering from Renal Failure according to Gender, Babylon Province/ Iraq, during the Year 2020-2021

Gender	Suspected Cases	Confirmed Cases	Infection Ratio (%)
Male	178	31	17.42
Female	110	17	15.45

Table 3. Suspected and Confirmed Cases of Hepatitis B Infection in Individuals Suffering from Renal Failure according to Age, Babylon Province/ Iraq, during the Year 2020-2021

Age Group (Years)	Male			Female			Total		
	Sc	Cc	%	Sc	Cc	%	Sc	Cc	%
11-20	1	0	0	2	2	100	3	2	66.67
21-30	7	3	42.86	8	1	12.5	15	4	26.67
31-40	38	7	18.42	29	3	10.35	67	10	14.93
41-50	67	17	25.37	37	9	24.32	104	26	25
51-60	42	2	4.76	22	1	4.55	64	3	4.69
61-70	23	2	8.70	12	1	8.33	35	3	8.57

Sc - Suspect case, Cc - Confirmed case.

Table 4. Confirmed Cases of Hepatitis B Infection in Individuals Suffering from Renal Failure according to Blood Groups, Babylon Province/ Iraq, during the Year 2020-2021

Blood Groups	Male		Female		Total	
	Cc	%	Cc	%	Cc	%
A+	4	12.90	5	29.41	9	18.75
A-	0	0	0	0	0	0
B+	1	3.23	1	5.88	2	4.17
B-	0	0	0	0	0	0
AB+	2	6.45	1	5.88	3	6.25
AB-	0	0	0	0	0	0
O+	12	38.71	7	41.18	19	39.58
O-	1	3.23	0	0	1	2.08
Unknown	11	35.48	3	17.65	14	29.17

*Cc - Confirmed case.

Table 2 shows the incidence of male and female infection in suspected and confirmed cases in the province, with the highest percentage of males (17.42%) compared with females (15.45%).

Where the ages of the infected 15 years to 64 years, and most of the infected in the age group (11-20), (21-30), (41-50) years, which was 66.67%, 26.67%, 25%, respectively and Table 3 illustrates this.

The results according to the blood group of HBV are described in Table 4. The results revealed that 39.58% and 29.17% who were O+ and unknown blood group, respectively for HBV have confirmed cases comparison to another blood group.

Discussion

Hepatitis B virus is still an important cause of infectious diseases in Iraq and the province of Babylon in particular. The reason for this spread is the result of the gathering of people in the home or workplace (blood contact), hemodialysis, autoimmune disease, favorable environmental factors for viral transmission, and other risk groups. Therefore, immunization remains the most effective way to control hepatitis B. The hepatitis B virus vaccine has been available since 1982 and has been administered in conjunction with other globally administered vaccines given at birth. Globally, the prevalence of anti-HBsAg carrier status has changed rapidly since this became available and universal infant immunization implemented.¹³

The results of the current study showed an incidence of increased risk of hepatitis B virus disease in patients with renal failure, which was found to spread through many factors, including the virus type, seasons of the year, patient's gender and age group, in addition to blood groups.

Hepatitis B virus not only affects the liver but is also implicated in causing membranoproliferative glomerulonephritis and membranous nephropathy, although the prevalence of HBV infection in renal dialysis units is controlled, it was one of the major and important successes in the management of end-stage renal disease. However, the transmission of HBV still occurs through contamination of equipment, environmental surfaces, and the use of multiple vials of medication. Patients with renal failure have a suboptimal response to HBV vaccination and vaccination is still beneficial for these patients. However, reports indicate that most patients with renal failure were either unimmunized or given suboptimal doses. In addition, immunization of patients with renal failure helps control infection in dialysis settings.¹⁴

The results of Table 1, showed that the infection does not depend on a specific season for the occurrence of the disease, but rather on mainly common ways of transmission of the disease.

The current results indicated that the sex of the infected

person plays an important role in the predisposition to infection with viral diseases, and through our study, the incidence of males was higher than females, and these results are consistent with the findings¹⁵ that infection rates are high in males compared to females. Its reason is that males represent the largest proportion of mixing with the external environment, in addition to some customs that society allows for males without females, such as male frequency for cupping, which is practised by simple people from the general community, which is one of the most important ways to transmit disease and the potential of drug abuse, in addition to the possibility of males engaging in illegal relations, therefore, the incidence of males is more than females.

The results of the studies also showed that there are differences in the incidence of infection in different age groups that were studied, shown by Table 3 that the age group with the highest percentage of young people injured have been recorded compared to other age groups, and this is in agreement with the findings,¹⁶ which noted that the youth the highest infection rate.

Regarding the results of the relationship between ABO blood groups and HBV infection. Our results indicated that blood group B+ was less associated with hepatitis B virus infection, on the contrary in blood group O+, which had higher rates of HBV infection, and this is supporting evidence of a statistical and biological association between ABO blood groups and HBV infection, This association may be attributed to regional factors, due to the significant relationship between HBV endemicity and regional health and economic development, and these results are consistent with those of some previous studies.^{17,18,19}

Therefore, more necessary measures should be taken regarding 'universal' O blood type in areas where the disease is prevalent due to the increasing unvaccinated population among blood donors and the current and window period for detection among those infected with HCV.¹⁹

Conclusion

We concluded that the prevalence of hepatitis B virus disease in people with kidney failure in large proportions, although the disease has little or almost no association with renal failure compared to type C, which is the most common, the rate of infection in June and September was higher than in other months, the incidence of infection among males is higher than that of females, the incidence rate for the age group of young people is higher than that of the other groups and lower incidence of HBV infection with blood type B+ compared to blood group O+ was at the higher.

Therefore, we recommended that dissemination of community awareness and provision of quality services

in the health field, which is the most appropriate way to eliminate this disease, monitoring haemodialysis units to limit the spread of this disease by sterilizing sanitary ware, especially tools used for the purpose of dialysis, imposing a mandatory vaccination program for all citizens in the governorate and providing medicines for the treatment of the hepatitis B virus, periodic check-ups for the purpose of early detection of the disease and preventing it from reaching acute and chronic cases, it is necessary to expand studies in this field to find out the reality of the disease in Iraq, especially the Babylon province, due to the lack of studies on this subject, encouraging researchers to find advanced preventive and curative methods that differ from what exists to eliminate or limit the spread of this disease and more studies are needed to clarify the true role of ABO blood group in HBV infection to address the global problem of HBV infection.

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