

PREVALENCE OF HEPATITIS B AND C VIRUSES AMONG HAEMODIALYSIS PATIENTS IN NINAWA AT NORTH OF IRAQ DURING 2020

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ABSTRACT

Background: viral hepatitis B & C are regarded a great health problem all over the world as these infections may lead to chronic illness causing liver cirrhosis, hepatocellular carcinoma & liver failure. The infections with hepatitis B virus and hepatitis C virus are considered as the most common blood-borne infections in subjects on regular haemodialysis, therefore this study done to see the prevalence of hepatitis B and C viruses among haemodialysis patients in Ninawa at north of Iraq for the year 2020. **Methods:** This is a cross sectional study which was carried out on haemodialysis patients in the dialysis unit at Ibn-seena teaching hospital and Mosul general hospital as they represent the sole dialysis centers in Ninawa. The notes of patients on maintenance haemodialysis were studied by the researchers to collect data regarding the serology status (hepatitis B surface antigen, Anti- hepatitis C virus using ELISA technique), vaccination coverage with three doses of hepatitis B vaccine and data regarding age, gender & residence of these patients. **Results:** A total of 295 patients were included in this study. it is found that the prevalence of hepatitis B was 3.4% (10cases) and the prevalence of hepatitis C was 2.7% (8cases) We found that 6 of hepatitis B patients were male (3.9%) and 4 were female (2.8%) and 7 of hepatitis C patients were male (4.5%) and only one case was female (0.3%). All of hepatitis B&C patients were in the age above 15 years. The coverage with hepatitis B vaccine of all haemodialysis patients recruited in the study was only 47%. **Conclusion & Recommendation:** The prevalence of hepatitis B & C among haemodialysis patients in Ninawa is intermediate, in addition to low coverage of these patients with hepatitis B vaccination. So it is strongly recommended to increase coverage of all haemodialysis patients with Hepatitis B vaccine which is of vital importance in prevention of hepatitis B infection in this high risk group, In addition to strict adherence to infection control guidelines.

KEYWORDS: Haemodialysis, Hepatitis B virus, Hepatitis C virus, Ninawa.

INTRODUCTION

Hepatitis B and hepatitis C viruses are major health problems worldwide. It is estimated that about 350 million people are chronically infected with hepatitis B in the world.^[1,2]

Infections with these viruses are associated with long-term complications leading to liver cirrhosis, hepatic failure, and hepatocellular carcinoma.^[1,2] The infections with hepatitis B virus and hepatitis C virus are considered as the most common blood-borne infections in subjects on regular hemodialysis.^[3] The prevalence of hepatitis B has been studied in the general population and it ranges from less than 1% in developed countries to more than 10% in Southeast Asia.^[4] while the

prevalence of hepatitis B virus infection in haemodialysis patients ranges from less than 1% in developed countries to as high as 20% in developing countries.^[5] Additionally, the prevalence of hepatitis C in the general population ranges from 10% in developing countries to less than 1% in developed countries,^[2] and the prevalence of hepatitis C in haemodialysis patients ranges from 5% in developed countries to up to 53% in developing countries.^[6]

There is a need to monitor the prevalence of such viruses in haemodialysis patients for the early discovery of the outbreaks and the elimination of the viruses.

The World Health Organization has put a goal for the elimination of these infections by the year 2030, so to

reach this goal, it is necessary to eliminate the infection in patients who are at high risk such as haemodialysis patients.^[7]

There are few studies on the prevalence of hepatitis B virus and hepatitis C virus infections in patients on haemodialysis. Hence, the aim of this study is to find out the prevalence rate of these infections among haemodialysis patients in Ninawa.

METHODS

This is an observational cross sectional study which was performed in the dialysis units at Ibn-seena teaching hospital and Mosul general hospital as the sole dialysis centers in Ninawa during 2020.

All patients (295) with regular haemodialysis were included in this study. Hepatitis B surface antigen, and hepatitis C virus antibodies were tested using the commercial ELISA kit, the records of patients on maintenance haemodialysis were reviewed by the investigators to determine the seropositivity and negativity of hepatitis B and hepatitis C, age, gender, vaccination history, residency according to health districts, patients considered infected when they had positive hepatitis B surface antigen in their serum. Patients with positive hepatitis C virus antibody which was determined by ELISA test were regarded infected with hepatitis C virus if confirmed by highly sensitive

quantitative polymerase chain reaction (PCR). Data which was collected and entered in (software package for social science) (SPSS) version 21 and was analyzed by simple statistics. No specific medical or invasive intervention was used in this study.

RESULTS

A total number of 295 haemodialysis patients were included in this study, it is found that the prevalence of hepatitis B was 3.4% (10 cases) and the prevalence of hepatitis C was 2.7% (8 cases) (table 1). The number of males was 154 (52%) from the total sample from them 6 cases (3.9%) were hepatitis B positive and 7 cases (4.54%) were hepatitis C positive, while the females formed around 48% (141 patients) of the total sample from them 4 cases (2.8%) were hepatitis B positive and 1 case (0.3%) was hepatitis C positive (Table 2 and 3). Most haemodialysis patients (97%) were above 15 years old, we found no positive cases for hepatitis B or C below 15 years of age (Table 4, 5). Forty seven percent (47%) of haemodialysis patients were vaccinated with three doses of hepatitis B vaccine as shown in figure 1. There are no patients were found positive for both hepatitis B&C.

The study found that the residence of all hepatitis B & hepatitis C cases were in Al-Ayser, Al-Aymen & Al-Hamdanya health districts (hepatitis B) (5, 2 and 3 cases) & (hepatitis C) (5, 2 and 1 case) respectively (Table 6).

Table (1): Prevalence of hepatitis B, C among haemodialysis patients in Ninawa during 2020.

NO. of haemodialysis patients	Type of infection	NO. of cases	Prevalence
295	Hepatitis B	10	3.4%
	Hepatitis C	8	2.7%

Table (2): Prevalence of hepatitis B cases among haemodialysis patients by gender in Ninawa during 2020.

Gender	NO. of haemodialysis patients	NO. of hepatitis B	Prevalence
male patients	154	6	3.9%
female patients	141	4	2.8%
Total	295	10	3.4%

Table (3): Prevalence of hepatitis C cases among haemodialysis patients by gender in Ninawa during 2020.

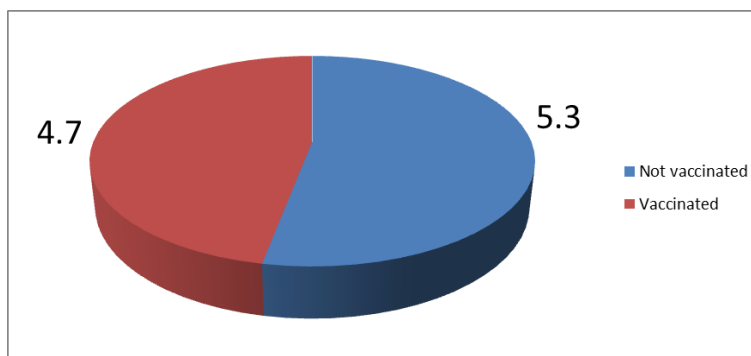
Gender	NO. of haemodialysis patients	NO. of hepatitis C	Prevalence
male patients	154	7	4.54%
female patients	141	1	0.3%
Total	295	8	2.7%

Table (4): Prevalence of hepatitis B among haemodialysis patients by age group in Ninawa during 2020.

Age group/year	NO. of haemodialysis patients	Hepatitis. B	Prevalence
Lessthan 15	7	-	-
15-44	113	6	2%
45&above	175	4	4%
Total	295	10	3.4%

Table (5): Prevalence of hepatitis C among haemodialysis patients by age group in Ninawa during 2020.

Age group\year	NO. of haemodialysis patients	Hepatitis. C	Prevalence
Lessthan 15	7	-	-
15-44	113	7	6.1%
45&above	175	1	0.5%
Total	295	8	2.7%

**Figure 1: Coverage of vaccinated haemodialysis patients with hepatitis B vaccine in Ninawa during 2020.****Table (6): Distribution of positive hepatitis B, C cases & haemodialysis patients according to residence by health districts in Ninawa during 2020.**

Health districts	haemodialysis patients	No.of hepatitis B patients	No. of hepatitis C patients
Al-ayser	101	5	5
Al-aymen	87	2	2
Telafer	32	-	-
Hamdanya	44	3	1
Telkeef	12	-	-
Other health districts*	19	-	-
Total	295	10	8

* (Qyara, Hatra, Shekhan, Makhmoor, Sinjar, Baaj)

DISCUSSION

According to (WHO) recommendation Hepatitis B, C prevalence of 1% or less regarded as a low & between 1-6% regarded as intermediate & 6% and above regarded as high prevalence.^[7]

This study revealed a prevalence rate of hepatitis B, C infection in haemodialysis patients was 3.4%, 2.7% respectively which is regarded as intermediate level according to WHO recommendation. This prevalence points to the importance of nosocomial transmission of hepatitis B, C among haemodialysis patients. The results of this study is similar to that of a study done in Duhok-Iraq during 2019 which found a prevalence of hepatitis B virus, hepatitis C virus were (3.49%) and (2.1%) respectively,^[8] and lower than the results found in a study done in Saudi Arabia during 2015 on haemodialysis patients which found prevalence of HBV of 4.6%.^[9] and also lower than another study done in Jordan during 2008 found a prevalence hepatitis B in haemodialysis patients of 5.9%.^[10] on other hand it is much lower than the result of another study conducted in Turkey, during 2006 were the prevalence of hepatitis B virus and hepatitis C virus were 13% and 20%, respectively.^[11]

In this study, the prevalence of hepatitis B virus and hepatitis C virus in patients on haemodialysis was in the intermediate zone.^[12] On the other hand the coverage of hepatitis B vaccine was low 47% so a good coverage with three doses of hepatitis B vaccine may help to decrease the transmission of infection in this risk group. On the other hand, the low prevalence of hepatitis C virus positivity in this group of patients, along with the approval of direct-acting antiviral drugs with high success rates makes the elimination of the virus feasible.^[13,14] So, the elimination of viral infections in this risk group may be feasible by implementing a good infection control program, good vaccination coverage with hepatitis B vaccine, and treatment of hepatitis C virus.^[15-19]

This study has several limitations: it is a cross sectional study that was carried at one time point; there was no indication of the sequence of events so the cause effect relationship could not be ascertained and the number of patients was relatively small to generalize our results. Hence, more representative studies are needed to confirm our results.

CONCLUSION AND RECOMMENDATION

The prevalence of hepatitis B and C in haemodialysis patients in Ninawa during 2020 is intermediate but still lower than that found in several studies. and to decrease such risk of infection we recommend to achieve complete coverage of all haemodialysis patients with three doses of hepatitis B vaccine which is of vital importance in prevention of hepatitis B infection in this high risk group, and we recommend a Strict adherence to infection control guidelines, however more representative studies are needed to confirm such results.

REFERENCES

1. Jefferies M, Rauff B, Rashid H, Lam T, Rafiq S. Update on global epidemiology of viral hepatitis and preventive strategies. *World J Clin Cases*, 2018; 6(13): 589-99. doi: 10.12998/wjcc.v6.i13.589.
2. Petruzzello A, Marigliano S, Loquercio G, Cozzolino A, Cacciapuoti C. Global epidemiology of hepatitis C virus infection: an up-date of the distribution and circulation of hepatitis C virus genotypes. *World J Gastroenterol*, 2016; 22(34): 7824-40. doi: 10.3748/wjg.v22.i34.7824.
3. Kalantari H, Ebadi S, Yaran M, Maracy MR, Shahshahan Z. Prevalence and risk factors of hepatitis B and C viruses among hemodialysis patients in Isfahan, Iran. *Adv Biomed Res.*, 2014; 3: 73. doi: 10.4103/2277-9175.125869.
4. Shepard CW, Simard EP, Finelli L, Fiore AE, Bell BP. Hepatitis B virus infection: epidemiology and vaccination. *Epidemiol Rev.*, 2006; 28: 112-25. doi: 10.1093/epirev/mxj009.
5. Fabrizi F, Messa P, Martin P. Hepatitis B virus infection and the dialysis patient. *Semin Dial.*, 2008; 21(5): 440-6. doi: 10.1111/j.1525-139X.2008.00437.x.
6. Wright TL, Pereira BJG. Hepatitis C virus. *Semin Dial. Avicenna J Clin Microbiol Infect*, Volume 7, Issue 1, 2020 33 The prevalence of HBV and HCV in patients with ESKD in Duhok, 1997; 10(5): 241-4. doi: 10.1111/j.1525-139X.1997.tb00502.x
7. World Health Organization. *Hepatitis B fact sheet updated, July 2016*. Available from: <http://www.who.int/mediacentre/factsheets/fs204/en/>.
8. Ibrahim NM, Saleema ZSM, Hussein NR. The prevalence of HIV, HCV, and HBV among hemodialysis patients attending Duhok Hemodialysis Center. *Int J Infect*, 2018; 5(1): e63246. doi: 10.5812/iji.63246.
9. SCOT Saudi center for organ transplantation-annual report, 2015; 83: 2015. Available from: www.scot.org.sa/pages/Doc15.
10. Al Hijazat M, Ajlouni YM. Hepatitis B infection among patients receiving chronic hemodialysis at the Royal Medical Services in Jordan. *Saudi J Kidney Dis Transpl*, 2008; 19(2): 260-7.
11. Yakaryilmaz F, Gurbuz OA, Guliter S, Mert A, Songur Y, Karakan T, *et al.* Prevalence of occult hepatitis B and hepatitis C virus infections in Turkish hemodialysis patients. *Ren Fail*, 2006; 28(8): 729-35. doi: 10.1080/08860220600925602.
12. Ashkani-Esfahani S, Alavian SM, Salehi-Marzijarani M. Prevalence of hepatitis C virus infection among hemodialysis patients in the Middle-East: A systematic review and meta-analysis. *World J Gastroenterol*, 2017; 23(1): 151-66. doi: 10.3748/wjg.v23.i1.151. [PubMed: 28104991]. [PubMed Central: PMC5221279].
13. Hepatitis B: fact sheets WHO (<http://www.who.int/medicare/centre/factsheets/fs204/en>) website.
14. Hussein NR. The efficacy and safety of sofosbuvir-containing regimen in the treatment of HCV infection in patients with haemoglobinopathy. *Mediterr J Hematol Infect Dis.*, 2017; 9(1): e2017005. doi: 10.4084/mjhid.2017.005.
15. Hussein NR, Saleema ZSM, Abd QH. Direct acting antiviral treatment for patients with end-stage kidney disease with acute HCV infection. *Mediterr J Hematol Infect Dis.*, 2019; 11(1): e2019034. doi: 10.4084/mjhid.2019.034.
16. Al Zabadi H, Rahal H, Fuqaha R. Hepatitis B and C prevalence among hemodialysis patients in the West Bank hospitals, Palestine. *BMC Infect Dis.*, 2016; 16: 41. doi: 10.1186/s12879-016-1359-8. [PubMed: 26830673]. [PubMed Central: PMC4736137].
17. Zahedi MJ, Darvish Moghaddam S, Alavian SM, Dalili M. Seroprevalence of Hepatitis Viruses B, C, D and HIV Infection Among Hemodialysis Patients in Kerman Province, South-East Iran. *Hepat Mon.*, 2012; 12(5): 339-43. doi: 10.5812/hepatmon.5969. [PubMed: 22783346]. [PubMed Central: PMC3389360].
18. Yuan J, Yang Y, Han F, Zhang P, Du XY, Jiang H, *et al.* Quality control measures for lowering the seroconversion rate of hemodialysis patients with hepatitis B or C virus. *Hepatobiliary Pancreat Dis Int.*, 2012; 11(3): 302-6. doi: 10.1016/S1499-3872(12)60164-7. [PubMed: 22672825].
19. Sarhan II, Kamel CR. Prevalence of hepatitis C virus seroconversion among hemodialysis patients in Egypt. *Egypt Liver J.*, 2015; 5(2): 34-9. doi: 10.1097/01.elx.0000463167.48017.41.