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Prevalence of Hepatitis B Virus in Hemodialysis Patients Infected with Hepatitis C Virus in Mosul District / Iraq

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Abstract

Most problematic infection haemodialysis (HD) are at higher risk for acquiring Hepatitis B virus (HBV) and Hepatitis C virus (HCV) infections than the general population.

Patients and Methods

This study was carried out between January 2018 until July 2018, a total of (60) blood samples were collected from hemodialysis patients. The samples tested against anti-HCV, HBsAg anti-HBS and anti-HBC IgM, using ELISA technique and determination HBV-DNA, HCV-RNA viral load by Real time polymerase chain reaction.

Results

Prevalence HCV RNA was 12(20%) out of 60 patients were RT-PCR positive for HCV RNA with viral load, up to 100.000, Copy/ml and 10(16.69%) out of 60 patients were RT-PCR positive for HBV DNA in both positive and negative HCV RNA patients group with average viral load more than 100.000 copy/ml., 3 Patients out of 12 (25%) HCV RNA, positive patients were also positive for HBV DNA, while 40 (66%) out of 60 patients were anti-HBSAg positive, while the positivity of anti-HBCoIgM was 5 (50%).

Conclusion

The prevalence of co-infection hepatitis B and C was high in hemodialysis patients in Mosul district/Iraq

Keyword: HCV; HBV; hemodialysis.

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1. Introduction

Although dialysis is the treatment of choice for end-stage renal failure, dialysis patient are at risk for contracting blood-borne infection, including hepatitis viruses HBV and HCV [1]: viral hepatitis among dialysis patients is associated with significant severity and poor prognosis [2] and both HBV and HCV synergize in accelerating the progression to hepatic anomalies [3] , although some dispute any effect of combined HBV/HCV infection on acceleration of liver disease [4]. Previous screening for HBV and HCV infection relied on serologic tool (HBsAg and anti-HCV for HCV), and change the liver enzymes [5]. In view of the false-negatives inherent in serology testing [5,6] this highlighted the need for accurate means of detecting HBV/HCV including polymerase chain reaction (PCR) [6,7]. Determination of the virus type and viral load serve an important diagnostic tool in the patients follow up and treatment [2,7]. There are very few reports on the prevalence of such dual infections in hemodialysis patients. The present study was undertaken to estimate the prevalence of HBV and HCV dual infection among hemodialysis patients.

2. Patients and Methods

Collected blood samples from 60 chronic hemodialysis patients in Mosul-Iraq to detect HCV and HBV infection in them, there were 40(66.6%) males and 20(33.3%) females and the average age of patients was 20-60 years.

2.1 Enzyme linked immunosurbent assay (ELISA)

Screening test for anti-HCV and HBSAg were performed using Anti-HVC ELISA kit (plasmatic UK) Anti-HBC and Anti-HBS test were also performed using ELISA kit (Bio kit, Spain).

2.2 Polymerase chain reaction test

2.3 RNA and DNA Extraction

HCV RNA and HBV DNA were extraction using nucleic acid isolation kit (Omega Bio-tek). The test done according leaflet inside the kit.

- Real time RCR tests.
- Quantitative of HBV DNA.

HBV DNA quantitation test were preformed using HBV DNA (primer design kit) and used real times PCR detection (q tower for analytic gene company, Germany).

- Quantitative of HCV RNA

3. Results

Anti-HCV was positive in 12 out of 60 (20%), while patients, HBSAg was positive in 10 out of 60(16.6%) patients. But other HBV serological marks was positive anti-HBs, 40 out of 60(66%), anti-HBC 5 out of

10(50%). When examination by ELISA assay shown in table (1).

Table 1: Percent of HBV serology marker in hemadialysisi patients by ELISA assay

Total No.	Viral marker							
	Anti-HCV		HBSAg		Anti-HBs		Anti-HBcoIgM	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
60	12 (20%)	48 (80%)	10 (16.6%)	50 (83.3%)	40 (66%)	20 (34%)	5 (50%)	5 (50%)

This result is compatible when examination by real time technique, HCV RNA was positive in 12 out of 60 (20%). HBV DNA was positive in 10 out of 60 (16.6%) patients.

Table 2: The percent of positive of HCV RNA and HBV DNA in Hemodialysis patients in real time PCR.

Total Number	HCV RNA		HBV DNA	
	Positive	Negative	Positive	Negative
60	12(20%)	48(8%)	10(16.6%)	50(83.3%)

According to Real time co-infection HCV and HBV was positive in 3 out of 12 (25%) patients was shown in table (3).

Table 3: The percent of HCV RNA and HBV confection among hemodialysis

Total number of HCV RNA positive	**Confection HCV RNA positive and HBV DNA positive**
12	3(25%)

Our results also revealed no significant difference between the HCV RNA positive male (66.6%) and female hemodialysis patients (33.3%). The study show no significant difference in the duration of receiving blood and their components between the positive and negative patients as shown in table (4). The average age of HCV patients was 45.5 years and 46.51 years in HCV negative patients, there for no significant difference was observed prevalence of HCV infection and the age of patients as shown in table (4).

Table 4: Average age and frequency of transfusions in hemodialysis patents with hepatitis C virus infection

HCV	**Number of samples**	**Average ± SD age (years)**	**Average ± SD duration since last blood transfusion month**
negative	48	45.5 ± 20.44	13.5 ± 8.23
positive	12	46.16 ± 14.52	12.5 ± 8.92
total	60	46.5± 20.1	12.9 ± 8.89

Our result showed that HBV DNA 10 out of 60(16.6%) was detected through the PCR study in both patients groups with positive and negative HCV RNA. But 3 out of 12 (25%) HCV RNA positive were HBV DNA positive, and 4-out of 60 (66%) patients were positive for anti-HBS. While 5 out of 10 (50%) patients and HBV DNA were positive for anti-HBC.

4. Discussion

Similar transmission models, HCV and HBV co-infection is prevalent, in this study, HBV were detect in hemodialysis patients with chronic HCV patient, viral interference has been described in patients with dual HBV and HCV infection [8]. In the present study, a higher frequency was found a many HBV-negative patients than HBV, although this difference was not significant. More preside studies, such as quantitation of both viral genomes and genotype are needed to evaluate the interference of replication between these two viruses [9,10]. The mechanism of viral interference is not known, but the host immune response could be involved in mediating the suppressive effect of one virus on the other [8], if this is the case, viral interference between HBV and HCV might not occur in immune compromised hosts like hemodialysis patients. The possible routes of transmission of HCV in hemodialysis patients are multiple and some of them are still controversial. The frequent blood transfusions in this group of patients have been an important route of infection before blood testing become available. There is, haw ever, increasing evidence of the nosocomial transmission of HCV, as described previously for HBV. The sharing of equipment as mode of HCV transmission is still controversial. Recent studies argue against HCV transmission through the hemodialysis ultrafiltration [11]. Beneficial effect of isolating equipment for HCV positive patients has been described [12-14]. The significantly higher frequency of blood recipient among HCV positive patients compared with that among the uninfected group table (4) suggests that blood transfusion remains an important mode of exposure to HCV [15]. However, blood transfusion alone cannot account for the high prevalence and incidence of HCV infection that was observed and nosocomial transmission of HCV map play a role in the spread of HCV in this group as described by others [16, 17,18]. The duration of hemodialysis correlates with HCV positivity, nosocomial transmission among hemodialysis patients has recently been documented by molecular analysis [19, 20]. The hemodialysis machine used in the unit studied might also play a role in HCV dissemination because of accidental contamination of the device for pressure testing and inadequate subsequent disinfection. On the other hand, even if no disposable equipment of syringes were shared in these units, multiple parental exposure and the sharing of drugs (heparin) among different patients could be involved in HCV transmission, on the other hand, even if transfusion has been the main mode of HBV and HCV transmission in the past. Nosocomial transmission now seems to play role in the dissemination of HCV among these patients. Recent studies have shown that strict aseptic measures can virtually eliminate HCV contamination, with high prevalence of HCV infection [21], preventing the consequences of infection not only by HCV but by other non-A, non-B and non-C viruses that could circulating in these venally compromised patients [22,23]. With those, our results are in- compatible of [27] from Iran, may be the difference in number of sample or genetic factor or immune state in the patients, and our results are in-compatible with those (26) from Turkey. They were unable to detect HBV DNA in hemodialysis HCV infected patient, it is probably due to several factors such as the intermediate prevalence of HBV in your region and safety of blood and it is component [25].

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