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To Determine the Seroprevalance of Hepatitis B Surface Antigen (HBsAg) and ANTI-HCV Antibodies in Patients Undergoing Haemodialysis

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Abstract: ***Hepatitis B and C is globally one of the most common and severe infectious diseases that leads to significant morbidity and mortality. As such chronic kidney disease is an immune deficient state, hence blood borne viral infection particularly HBV and HCV are important cause of morbidity and mortality of patients treated by haemodialysis. Patients who have undergone haemodialysis for end-stage renal failure are at a higher risk for infections. Aim of the study was to determine the seropervalence of hepatitis B surface antigen (HBsAg) and Anti-HCV antibodies in patients undergoing Haemodialysis. Serological test for Hepatitis B & Anti-HCV was done by immuno-chromatographic HBsAg and Anti-HCV kit or by CLIA. Immunodiagnostic System. Prevalence of HCV (50.7%) was slightly higher than that of HBsAg (49.23%) out the positive cases (65/695) in the Hemodialysis patient. Among the 65 patients, majority i.e. 75% HBsAg and 69% Anti-HCV reactive were those who underwent dialysis <50 times. We concluded that HCV was more prevalent than that of HBsAg in Hemodialysis patient more studies must be conducted for further research.***

Keywords: HBsAg, Anti-HCV, Haemodialysis

1. Introduction

Hepatitis B and C viruses are common causes of acute and chronic hepatitis.

Two billion people worldwide have been infected by HBV; 400 million are Chronically infected while 520,000 people die due to HBV related conditions .[1] Approximately 170 million people are affected with HCV worldwide, comprising 3% of the global population.[2]

The endemicity of HBV infection varies greatly over the world, from highly endemic areas (> 8% infection rate), to intermediate (2−8%) and low endemicity areas (< 2%). Africa is among the highly endemic areas, but some countries in the north fall in the intermediate category, with an average rate of about 7%, whereas most regions of west and east Africa are highly endemic areas with chronic infection rates of 7−10% .[3]

The prevalence of Anti-HCV is particularly high in developing countries like India and is a major cause of increased morbidity and mortality in patients with terminal stage of renal disease. Cirrhosis, higher rate of graft loss, Glomerulonephritis, and hepatocellular carcinoma are some of the far-reaching 2 effects of HCV positivity in haemodialysis patients.

As such CKD is an immune deficient state, hence blood borne viral infection particularly HBV and HCV are important cause of morbidity and mortality of patients treated by haemodialysis. [4-6] Patients who have undergone haemodialysis (HD) for end-stage renal failure are at a higher risk for infections that are transmitted by blood and blood products.[7]

The comparatively higher prevalence in the HD population of HBV and HCV viruses may be due to cross infection from other patients due to sharing of common equipments and requirements of multiple blood transfusions.[8] Synergistic infection with HBV and/or HCV in patients with ESRD predisposed the patient for accelerated progression of the disease.[9]

2. Materials and Method

A prospective study was conducted in the Department of Microbiology, Mahatma Gandhi Medical College and Hospital, Jaipur. Duration of this study was one year. All blood Samples of patients undergoing Haemodialysis received in laboratory for diagnosis of HBsAg & Anti HCV were included during 1year period .The study comprised of blood samples received from patients undergoing repeated Haemodialysis in MGH for HBsAg & Anti HCV testing.

Serological testing for HBV & Anti-HCV was performed at the Central Laboratory at MGMCH. Serological test for Hepatitis B & Anti-HCV was done by immuno-chromatographic SD Bioline's HBsAg and Anti-HCV kit or by CLIA VITROS® ECiQ Immunodiagnostic System by Johnson & Johnson.

3. Result and Observation

The study was carried on 695 patients who were undergoing Heamodialysis. Out of 695 patients, 32 patients were HBsAg positive and 33 were Anti-HCV positive. Among them 1 patient was co infected with HBsAg and HCV.

Table 1: Prevalence of HBsAg and HCV Patients

Total number patients	HBsAg positive	Anti-HCV positive	Total positive cases	Negative
695	32	33	65	630
Percentage	4.6%	4.74%	9.35%	92.65%

In Table 1 we observed that Out of 695 patients,

undergoing heamodialysis total prevalence was found to be 65(9.35%) and prevalence of HBsAg was 32(4.6%) & Anti-HCV was 33(4.74%).

Table 2: Frequency of HBsAg and Anti-HCV in a relation to number of dialysis

Number of dialysis	HBsAg positive	Anti-HCV reactive
<50	24(75%)	23(69.69%)
50-100	6(18.75%)	7(21.21%)
100-200	2(6.25%)	3(6.06%)
Total	32(100%)	33(100%)

According to table 2 Out of 65 patients, <50 times dialysis, 24 patients (75%) were HBsAg Positive and 23 patients (69.69%) were Anti-HCV reactive .In 50-100 times dialysis, 6 patients (18.75%) were HBsAg positive and 7 patients (21.21%) were HCV reactive. In 100-200 times dialysis, 2 patients (6.25%) were positive for HBsAg and 3 (6.06%) were reactive for Anti-HCV.

Table 3: Gender wise distribution of Anti-HCV and HBsAg positive cases

Gender	HBsAg	Anti -HCV
Male	27(84.37%)	23(69.69%)
Female	5(15.63%)	10(30.30%)
Total	32(100%)	33(100%)

Table 3 shows the gender distribution Among 32 HBsAg positive cases, 27(84.37%) were males and 5(15.63%) were females. Among 33 Anti-HCV positive cases 23(69.69%) were males and 10(30.30%) females.

Table 4: Age wise distribution of HBsAg and Anti-HCV positive cases:-

Age group	HBsAg	Anti-HCV	Total
15-20	1(3.1%)	0	1(1.53%)
21-30	8(25%)	2(6.06%)	10(15.3%)
31-40	5(15.6%)	8(24.24%)	13(20%)
41-50	8(25%)	13(39.39%)	21(32.30%)
51-60	6(18.75%)	8(24.24%)	14(21.53%)
61-70	3(9.3%)	2(6.06%)	5(7.69%)
>70	1(3.1%)	0	1(1.53%)
Total	32(100%)	33(100%)	65(100%)

Table no.4 shows the age wise prevalence among the diseased group. Among 32 HBsAg positive cases, highest prevalence was found in the age group of 21-30, 41-50 i.e. 8 (25%) followed by 51-60 6(18.75%) , 31-40 5(15.6%),61-70 3(9.3%),15-20 1(3.1%) &>70 1(3.1%) . Among 33 Anti-HCV positive cases reported, highest prevalence in the age group of 41-50 i.e. 13(39.39%) followed by 31-40 & 51-60 8 (24.24%), 21-30 &61-70 2(6.06%). Out of 65 positive cases highest prevalence found was found in the age group of 41-50 i.e. 21 (32.30%).

So in conclusion, the Prevalence of (50.7%) was slightly higher than that of HCV (49.23%) out the positive cases (65/695) in the Hemodialysis patient

4. Discussion

HBV and HCV infections are important causes of morbidity and mortality among patients undergoing HD and cause problems to manage patients in the renal dialysis units.[10,11] The current study showed a higher rate of HCV infection compared with that of HBV infection and variable rates among HD units were consistent with those of studies in other parts of the world.[12,13]This lower HBV rate in the current study could be explained by lower rates among general population[14], successful hepatitis B vaccination program, effective screening of donated blood, dialyzing on dedicated machines, and adherence to infection control measures.[12, 15]

Prevalence of HBsAg & Anti-HCV in our study was 32(4.6%) & 33(4.74%) respectively while in other study done by MD Jamil et. al.[16] (2016) found that out of 507 patients , 11 patients (2.17%) were found to be positive for HBV while and 7(1.38%) patients were found to be positive for Anti-HCV. Similar study was also conducted by Juhar et. al.[17] (2018) reported that a total of 253 patients were admitted, out of which HBsAg was positive in 1.2% (n=3/253) patients, Anti-HCV antibodies

Among 33 Anti-HCV positive cases, highest prevalence was noted in the age group of 41-50 i.e. 13(39.39%) followed by 31-40 & 51-60 8 (24.24%), 21-30 &61- 70 2(6.06%). In other study, by Chigurupati P et. al.[18] (2014) at Andhra Pradesh, reported twenty four patients out of which 102 screened tested positive for Anti-HCV antibodies, incidence of 23.5%. Majority of the seropositive cases belonged to the 41-60 age group that is 10(50%) and out of 65 positive cases, highest prevalence was found in the age group of 41-50 i.e. 21 (32.30%) were detected in 2.8% (n=7/253) patients, 4% of patients had markers of at least one viral infection and 0.4% (n=1) were positive for both HBV and HCV infection. Another study done by Perumal A et. al.[19] (2016) at Pondicherry reported that Among the 65 patients, 14 individuals were found be infected with hepatitis, HBV (5), and HCV (10) accounting for 22%. A single individual was coinfected with both the virus.

In our study, we found that male population were dominated than the females in both HBsAg and Anti-HCV positive cases that is HBsAg male found to be 27(84.37%) and female found to be 5(15.63%). In case of Anti-HCV male found to be 23(69.69%) and female found to be 10(30.30%). Similar results reported by Prakash et. al.[20] (2014) in Luck now Uttar Pradesh reported that out Of 186 participants, Anti-HCV Ab was positive in 13 patients (6.99%), out of which 11 (84.61%) were males and 2 (15.39%) were females and for the HBs Ag cases, six patients (3.23%) were positive for HBsAg, out of six cases, 3 (50%)males and 3 (50%) females. They are equally infected in his study.

In the following study, we found that out of 65 patients of with dialysis <50 times, 24 patients (75%) were HBsAg Positive and 23 patients (69.69%) were Anti-HCV reactive. In 50-100 times dialysis , 6 patients (18.75%) were HBsAg positive and 7 patients(21.21%) were Anti-HCV Reactive .In 100-200 times, dialysis 2 patients (6.25%)were positive for HBsAg and 3 (6.06%) were reactive for Anti-HCV. Similar study was also done by Anwar k et al 73 2016 in Pakistan reported that out of total 60 patients, he found 7 patients (11.66%) were HBsAg positive and 53 patients (88.33%) were HBsAg negative. Similarly out of total 60

patients, 14 patients (23.33%) were Anti-HCV positive and 46 patients (76.66%) were Anti-HCV negative.

Out of 32 HBsAg positive cases highest prevalence was reported in the current study was in the age group of 21-30 and 41-50 i.e. 8 (25%) followed by 51- 60 6(18.75%) , 31-40 5(15.6%),61-70 3(9.3%), 15-20 1(3.1%) & >70 1(3.1%). These results were in concordance with the study conducted by Perumal A et. al.[19] (2016) in Pondicherry, reported that out of 65 HD patients, HBsAg was detected in 4 patients (6%), HBV and Anti-HCV co- infection was detected in 1 patient (2%), and 50 (77%) patients were uninfected. Among HBV infected HD patients, 87% were males and 13% were females. Six percent of HBV infected HD patients were in the age group of 21–30 years, 40% of HBV infected HD patient were in the age group of 31–40 years, 27% of HBV or Anti-HCV infected HD patient in the age group of 41–50 years, and 27% of HBV infected HD patient were in the age group of more than 50 years and also found that three HD patients who had a past history of renal transplantation were not infected with HBV.

5. Conclusion

In this conducted study we concluded that Among the 65 patients, majority i.e. 75% HBsAg and 69% Anti-HCV reactive were those who underwent dialysis <50 times.

From 32 HBsAg positive cases, highest prevalence was found in the age group of 21-30, 41-50 i.e. 8 (25%) followed by 51-60 6(18.75%), 31-40 5(15.6%), 61-70 3(9.3%), 15-20 1(3.1%) &>70 1(3.1%). Similarly 33 Anti-HCV positive cases reported, highest prevalence in the age group of 41-50 i.e. 13(39.39%) followed by 31-40 & 51-60 i.e. 8 (24.24%), 21-30 &61-70 2(6.06%). Out of 65 positive cases highest prevalence found was found in the age group of 41-50 i.e. 21 (32.30%).

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