

Evaluating the Prevalence of HIV, HCV, and HBV Among Hemodialysis Patients Attending Tertiary Care Hospital in North Karnataka.

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Abstract

Introduction: Blood-borne viral infections are a major public health problem, especially in high-risk patients including those with renal failure undergoing hemodialysis. High prevalence of these infections in hemodialysis patients reflects the increased presence of common risk factors like high number of blood transfusions, prolonged vascular access, high exposure to infected patients and contaminated equipment and cross contamination from circuits. **Objective:** The aim of this study is to evaluate the prevalence of HIV, HBV, and HCV in patients on hemodialysis attending Gulbarga Institute of Medical Sciences, Kalaburagi. **Methods:** This is a one year retrospective study from 1st January 2020 to 31st December 2020. The patients' demographic characteristics, including age, gender, duration of dialysis and frequency of blood transfusion were recorded. Serological markers were determined by ELISA method. The prevalence of each virus was also determined. **Results:** All were patients with Chronic Kidney Diseases (CKD) on hemodialysis. There were total of 77 cases, comprising of 67 (87%) males and 20 (23%) females. Out of total 77 cases, 16 (20.7%) cases were seropositive; 13 patients were reactive for HBV, 1 patient was reactive for HCV, 1 patient was reactive for HIV and one patient had co-infection for HBV and HCV. Significant correlation was found between the cases and positivity. **Conclusion:** This study brings to light that viral infections, though less common, continue to remain as important causes of infection in hemodialysis patients. Vaccination is recommended for pre-end-stage renal disease patients before they become dialysis dependent. Since blood transfusion remains an important risk factor for transmission of viral infection, screening of blood products by Real-Time PCR may be recommended to prevent transmission.

Keywords: infections, disease

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Introduction

Blood-borne viral infection is a public health problem, especially in high-risk patients, including those with renal failure. High prevalence of these infections in hemodialysis patients reflects the increased presence of common risk factors like high number of blood transfusions, prolonged vascular access, high exposure to infected patients and contaminated equipment and cross contamination from circuits[1]. Hemodialysis is a trusted intermediate procedure for management of chronic kidney disease (CKD) 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 in patients treated by hemodialysis[2]. Patients on hemodialysis may be infected through blood transfusions, contamination of dialysis machines and equipments as well as interpersonal horizontal transmission in the dialysis units. Blood transfusion has been correlated with an increase in HBV infection. Hemodialysis patients with a long-term history were more likely to be infected than those with a short-term history. The risk for a patient to become HBV, positive increases 1.47 times due to 1 month of hemodialysis. HCV seroprevalence ranged between 0.7 and 18.1%

across different countries[2]. So, among hemodialysis patients regular evaluation may play an important role to reduce the burden of HBV and HCV infections. Vaccination is also recommended for pre-end-stage renal disease patients before they become dialysis dependent[3]. This study was planned to evaluate the prevalence of HIV, HBV, and HCV in patients with CKD on hemodialysis.

Methods and Materials

This is a retrospective study of one year from 01/01/2020 to 31/12/2020. The data was collected from records of all dialysis patients attending Gulbarga Institute of Medical Sciences (GIMS), Kalaburagi during the study period. The patient's demographic characteristics, including age, gender and frequency of blood transfusion were collected. Presence of serological markers determined by ELISA method and also history of seropositivity for HBV, HCV and HIV before starting of hemodialysis procedure was recorded.

Inclusion Criteria

All cases of Chronic Kidney Diseases with Arterio-venous fistula registered in the Institute and who required regular maintenance hemodialysis for atleast 6 months were included in this study.

Exclusion Criteria

Patients of acute renal failure requiring temporary dialysis were excluded.

Results

There were a total of 77 patients who had Chronic Kidney Diseases (CKD) and were attending the hospital for regular hemodialysis. Out

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of these 77 patients; 67 (87%) were males and 20 (13%) were females and their age ranged from 18 years to 70 years with mean age of 48.1 years (Table 1).

Table 1: Distribution of hemodialysis cases with respect to gender and age.

Age group (in years)	Male	Female
< 20	2	0
21-30	9	1
31-40	14	1
41-50	20	5
51-60	9	2
61-70	13	1
Total	67 (87%)	10 (13%)

Seropositivity for blood borne viral markers was seen in 16 (20.7%) male patients and their age ranged from 31 years to 70 years. No

female patients on hemodialysis were seropositive. Majority of the patients were in 41 to 50 years age group (Table 2).

Table 2: Distribution of seropositive cases with respect to age

Age(years)	HBV Positive	HCV Positive	HIV Positive
31 to 40	03	00	00
41 to 50	06	01	01
51 to 60	04	01	00
61 to 70	01	00	00

Out of the 16 seropositive patients, 13 (16.8%) were reactive for HBV, 1 (1.3%) for HCV and 1 (1.3%) for HIV. One patient (1.3%) had co-infection for HBV and HCV (Table 3).

Table 3: Distribution of HBV, HCV and HIV seropositivity status

	Total (%)	Sero-positive (%)
HBV	77 (100%)	13 (16.9%)
HCV	77 (100%)	01 (1.3%)
HIV	77 (100%)	01 (1.3%)
Co-infection (HBV & HCV)	77 (100%)	01 (1.3%)

Significant numbers of cases were found to be seropositivity (20.7%).

From the baseline study it was found that twelve (15.5%) patients were HBV positive and one (1.3%) patient was HIV-positive at the beginning of the hemodialysis procedure. They were on separate hemodialysis machine to prevent cross infection. After beginning of hemodialysis, three patients turned seropositive; one for HBV and one for HCV and another patient developed HBV and HCV co-infection. In the patient with co-infection there was a history of change of dialysis centre for a period of 3 months.

Discussion

Chronic renal failure patients receiving long term hemodialysis are often acquiring blood-borne viral infection like HBV, HCV, and HIV. In India, reported studies of HBV and HCV infection among hemodialysis patient is variable. In a study by Bhaumik P et al. (2012) and Kokane et al (2018) 7.3% and 6% HBV seropositivity was seen on dialysis dependent patients respectively [2,4]. Kapse et al (2017) showed 10% positive among multiple transfused patients [5]. In this study, HBV seropositivity (2.6%) during hemodialysis correlates well with the study by Kalantari et al (2014) 1.2%, Malhotra et al (2018) 1.5% and Ibrahim MR et al (2017) (3.2%) [6-8]. In the present study HCV positivity was seen in 1.3% where as in a study by Kosaraju et al (2013) 1.11%, Prakash et al (2013) 3.23% and Güvenir M et al (2019) 3.6% patients were HCV positive [8-10]. Kansay S et al (2019) showed 1.02% patients positive for HIV which is similar to present study showing 1.3% HIV positivity [11]. The risk of co-infection is also noted among the CKD patients due to the frequent exposure to blood from transfusions and extracorporeal circulation during hemodialysis. Co-infection of HBV and HCV in our study was 1.3% that correlated well with studies conducted by Bhaumik P et al (2012) 1.2%, Malhotra et al (2018) 0.8% and Khullar et al (2020) 0.67% [2,6,12]. Hence, strict adherence to universal precautions, proper maintenance of hemodialysis machines and proper disposal of used material (tubing, catheters, and fluid) should be implemented in the dialysis units to decrease the risk

of transmission of HBV and HCV [6]. In this study there was no HIV seropositivity following hemodialysis procedure which was similar to studies done by Ibrahim MR et al (2017) and Saha et al (2001) whereas studies by Güvenir M et al (2019) and Kansay S et al (2019) showed 0.7% and 1.02% HIV seropositive respectively [8,11,12,14].

Conclusion

This study highlights that blood borne transmission of viral infections, though less common, continue to remain an important cause of infection in hemodialysis dependent patients. Vaccination is recommended for pre-end-stage renal disease patients before they become dialysis dependent. Since blood transfusion remains an important risk factor for transmission of viral infection, screening of blood products by Real-Time PCR may be recommended.

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