

## SEROPREVALENCE OF HEPATITIS B AND C VIRUSES IN CHRONIC KIDNEY DISEASE PATIENTS IN INDORE

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**Abstract:** The present reports the prevalence of Hepatitis B and Hepatitis C infection in Chronic kidney Patients receiving maintenance hemodialysis (HD) are at higher risk for acquiring Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) infections than the general population. We aimed to investigate the incidence and prevalence of HBV and HCV infection in the HD population. A total of 142 patients were selected from 10 dialysis centers at Indore, Madhya Pradesh. Testing for Hepatitis B surface antigen (HBsAg) and anti-HCV antibodies was performed at initiation of dialysis and every 3–6 months thereafter. Patients who were sero-negative for HBV and HCV were followed up for 1 year to detect sero-conversions. New HBV infection was found in 7.19% of hemodialysis patients and 9.58% of patients got new HCV infection during hemodialysis. 83.3% of new HBV infected person required blood transfusion during the course of hemodialysis whereas all the new cases of HCV infection required blood transfusion during hemodialysis. Newer methods like Real Time PCR should be adapted for the screening of blood product at hemodialysis setup.

**Keywords:** Chronic Kidney Failure, Hemodialysis, Hepatitis B, Hepatitis C

### INTRODUCTION

Hepatitis B and C virus infection is a substantial global health problem. According to WHO more than two billion people worldwide have serological evidence of current or historical infection of Hepatitis B (HBV) [1] and 150 million people have chronically infected with Hepatitis C (HCV) [2]. Hemodialysis patients are at increased risk of acquiring HBV and HCV infections as compared with the general population because of increased exposure to blood products, shared hemodialysis (HD) equipment, breaching of skin and immunodeficiency [3,4]. Hemodialysis, which requires access to the bloodstream, also affords an opportunity for transmission of HBV and HCV between patients, and between patients and staff. Viral hepatitis complicating HD has been recognized from the earliest days of this therapy. While the introduction of vaccination programme and stringent infection control measures have succeeded in limiting the spread of hepatitis infection within dialysis facilities outbreaks continue to occur periodically and prevalence rates remain unacceptably high[5]. As these viral infections have common modes of transmission, presence of co-infection in patients is not rare and is relatively high in transfusion recipients [6-8]. However, data on the prevalence rates of these two viral infections in hemodialysis patients from Central India is lacking. So the aim of the present study was to investigate the epidemiological and clinical features of HCV and HBV infections in ten different hospitals having HD units at Indore, Madhya Pradesh.

### MATERIAL AND METHODS

This is a prospective multicenter study conducted at ten dialysis centers at Indore. The study was conducted for a period of 18 months from Jan 2011 to Dec 2012. All the patients visited dialysis unit at these centers was recruited for the study. Patient demographic and detailed clinical profiles were recorded. At the beginning of study all the staff of hemodialysis units at all centers were apprised about the study and status of the all the staffs in respect to HBV and HCV infections were evaluated to exclude any provider to patient transmission.

3ml blood sample were collected from each patient before the hemodialysis in a plain vacutainer. Samples were allowed to stand for 30 minutes at room temperature and then serum was separated by centrifuge. Serum was stored at -20° c for further use. Sero-positivity to HBV was defined by detection of hepatitis B surface antigen (HBsAg) and seropositivity to HCV by detection of anti-HCV antibodies by a third generation enzyme linked immunoassay (ELISA).

### RESULTS

A total of 167 patients were visited the 10 dialysis units of which 113 was male and 54 were female. The age of patients ranges from 14 to 80 year with a mean age of 43.59±13.28 years. The cause of renal failure includes chronic glomerulonephritis (56.4%), diabetes associate nephropathy (32.8%), autosomal polycystic kidney disease (4.3%), contrast-induced nephropathy

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(3.6%) and nephrosclerosis (2.3%). 145(86.82%) patients have hypertension. 142(85.02%) of the patients required blood transfusion before or after the HD.

Testing for Hepatitis B surface antigen (HBsAg) and anti-HCV antibodies was performed at initiation of dialysis and every 3–6 months thereafter.

Before the start of hemodialysis, HBsAg and Anti HCV were found positive in 5 (2.99%) and 2 (1.19%) patients respectively. Special precautions were taken during the HD of these infected people to prevent cross infection.

Patients who were sero-negative for HBV and HCV (160) were followed up for 1 year to detect sero-conversions. Immunization against HBV was done in 121 out of 160 uninfected patients before the start of HD and in 39 patients during the HD. But we did not measure the anti HBsAg antibody levels.

12 (7.18%) cases becomes HBsAg positive whereas 16(9.58%) patients get infected with HCV during the course of study. Out of 12 newly HBV infected persons, 10 required blood transfusions whereas all newly infected HCV persons required blood transfusion during the course of study.

## DISCUSSION

Despite the availability of serological tests and vaccines for hepatitis B virus and universal precaution standards and infection control measures, hepatitis is still a serious problem in patients on maintenance HD. Before HBV vaccination became routine, over half of the European dialysis units were contaminated with the virus and more than 22% of HD patients were HBsAg carriers [9]. With the introduction of routine vaccination and infection control practices, the prevalence of HBV infection among dialysis populations reduces the percentage prevalence. Epidemiologic investigations have indicated substantial deficiencies in recommended infection control practices, as well as a failure to vaccinate hemodialysis patients against hepatitis B. These practices apparently are not being fully implemented because staff members **a)** are not aware of the practices and their importance, **b)** are confused regarding the differences between standard precautions recommended for all health-care settings and the additional precautions necessary in the hemodialysis setting, **c)** Many patients are not vaccinated before starting dialysis because of delayed diagnosis. Even if the vaccination is started, it remains incomplete in many patients due to lost to follow up. HBsAg positivity rates among hemodialysis patients were reported to be 0.9% in the USA, 1.6% in Japan, 10.0% in Brazil, 10.0% in Hong Kong, 11.8% in Saudi Arabia and 16.8% in Taiwan, 2.6% in Libiya, 12% in Kosava, which grossly correspond to the endemicity of the infection in

the respective localities and length of time on HD, precaution techniques, and the number of blood transfusions [10-17]. In India, HbsAg positive rates among hemodialysis patients were reported to be 7% and 5.5% from Hyderabad and Tripura respectively [18-19]. In present study we found 7.1% HBsAg positive samples in the HD patients.

In case of HCV condition is more severe due to non-availability of vaccine and higher window period of virus for the screening in blood. The prevalence of HCV infection in HD patients varies from 5% to 60% in different parts of the world. The estimated prevalence of HCV infection in HD patients is 7.8% in the USA [20], 5.2% in Germany [21], and 10% in Japan [22]. In present study, 12.7 % of HD patients were HCV positive.

Patient's age and the number of transfused blood products are the 2 factors most consistently associated with increased prevalence of HCV infection in dialysis patients, irrespective of geographic location [23]. As a result of routine screening, compliance with infection-control precautions, and routine use of recombinant human erythropoietin, the prevalence of HCV infection among HD patients has declined. However, this rate is still significantly higher than the prevalence reported in the non-HD population [24-26]. Interestingly, spontaneous disappearance of HCV RNA has been documented in 1% of untreated HD patients [27]. Although overall mortality increases with HCV infection in HD patients, disease progression and advancement to liver failure appear to be slower and/or less likely compared to a nonuremic cohort [28]. HCV infection usually does not present with acute symptoms, and the progression of disease is a long-term process. Mostly, patients are diagnosed with HCV infection when they are tested after developing nonspecific symptoms such as fatigue, weight loss, jaundice, or elevations of liver enzyme levels. Development of those constitutional symptoms is not uncommon for HD patients. Thus, routinely screening this population is important, as these patients are at risk for acquiring HCV infection.

In conclusion, Despite of being screening and taking all the safety precautions Hepatitis C and B is still prevalent in HD patients. Therefore the newer and more sensitive methods like real time PCR should be adapted for screening of blood products especially for HD patients.

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