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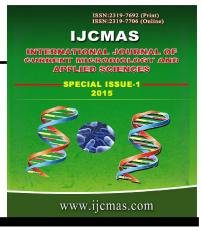

Original Research Article

Seropositivity Rates for Hepatitis B and C Viruses in Indoor Patients of a Tertiary Care Centre of Northern India

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Keywords

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A B S T R A C T

Distribution of sero-prevalence of HBV and HCV infection among inpatients, who had been treated for various diagnoses in different departments of Jawahar Lal Nehru Medical College between 2010 and 2014. Laboratory records of the indoor samples tested for HBsAg and anti-HCV antibodies in the laboratory over 5 years (2010 to October 2014), were retrospectively analyzed to determine seropositivity rates for HBV and HCV. All samples were tested by Commercial Enzyme Linked Immunosorbent Assays method approved by National AIDS Control Organisation. A total of 42329 blood samples were tested for HBV and HCV infections. Overall 2478 (5.85%) of the samples were positive for HBsAg and 1012 (2.39%) for anti-HCV antibodies respectively. The distribution of seropositivity for HBsAg and anti-HCV antibody varies by the department of sample origin. The medicine ward show the highest seropositivity rates for both HBsAg (9.81%) and HCV (4.24%) while lowest seropositivity rate for HBsAg was seen in gynaecological patients (2.70%) and for HCV infection in paediatrics patients (0.85%). We observed that patients admitted in medicine ward have significantly higher risk for HBV and HCV infections. Our findings emphasize the importance of Universal Precautions for all health professionals, particularly those who work in internal medicine department, so as to limit hospital acquired infection.

Introduction

Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are the two most common blood borne, hepatotrophic viruses. HBV and HCV are important causes of liver related mortality and morbidity. Hepatitis B and hepatitis C are significant public health problems especially in developing countries like India. Hepatitis B was first reported in 1963 and hepatitis C in 1988 (Blumberg, 1997; Bonkovski *et al.*, 2001). Since then Hepatitis B has infected 2 billion people in the world, which includes 350 million chronically infected cases. Hepatitis C virus accounts for 200 million chronic infections

worldwide. Hepatitis B and hepatitis C result in 563,000 and 366,000 deaths annually respectively (Voiculescu *et al.,* 2010).

HBV and HCV can be transmitted by contact with infected blood and body secretions. It is also transmitted horizontally through blood products and vertically from mothers to offspring. Other risk factors include intravenous drug abuse, sharing needles, dental procedures, tattooing, ear piercing, acupuncture and high-risk sexual behaviour (CDC, 1991). Transmission of HBV and HCV to healthcare workers at hospital is a matter of great concern (Kiyosawa *et al.,* 1991). Here most common cause is needle stick injury.

The Aim of this study was to determine the Distribution of sero-prevalence of HBV and HCV infection among inpatients, who had been treated for various diagnoses in different departments of Jawahar Lal Nehru Medical College between 2010 and 2014.

Materials and Methods

This retrospective study was carried out in Jawaharlal medical college, Aligarh, India. Data was collected from the Laboratory records of the indoor patients admitted from January 2010 to October 2014. This data include seropositivity of HBV and HCV in the indoor patients of surgery, medicine, gynaecology and paediatrics wards.

Procedure: A blood sample of 3-5ml was collected from patient using a sterile plain vacutainer, and the serum was separated by centrifugation and placed in sterile serum storage vials. Needle was destroyed using a needle destroyer and then discarded in a sharps box. Serum sample was examined for HBV and HCV infection. Anti-HCV antibody and HBsAg antigen were detected by using a third-generation ELISA (enzyme linked immunosorbant assay) (SD HCV ELISA 3.0, and SD HBsAg ELISA 3.0 manufactured by SD bio standard diagnostics pvt. Ltd. India) using fully-automated bichromatic spectrophotometer (Thermo fisher scientific). Absorbance was read at 450nm with reference wavelength at 620nm. Samples were considered reactive according to the manufacturer's specification. Seropositive samples were discarded as per standard protocols.

ELISA method is approved by National AIDS Control Organisation (NACO) for testing of HBsAg and anti-HCV.

Data was analysed using descriptive statistics.

Result and Discussion

A total of 42329 blood samples were tested for HBV and HCV infections. Overall 2478 (5.85%) of the samples were positive for HBsAg and 1012 (2.39%) for anti-HCV antibodies respectively (Table 1).

The distribution of seropositivity for HBsAg and anti-HCV antibody varies by the department of sample origin. The medicine ward show the highest seropositivity rates for both HBsAg (9.81%) and HCV (4.24%) while lowest seropositivity rate for HBsAg was seen in gynaecological patients (2.70%) and for HCV infection in paediatrics patients (0.85%) (Table 3).

Out of the total patients tested 26128 (61.7%) were males and 16201(38.3%) were females. Seroprevalence of HBV and HCV was significantly higher among males (6.4%, 2.7%, respectively) than females (4.9%, 1.9%, respectively). Fifty four patients were found to be positive for both HBsAg and anti-HCV (Table 2).

Infection with HBV and HCV is an important public health issue especially in developing countries like India where the facilities for treatment and infrastructure is inadequate.

According to the hepatitis B surface antigen (HBsAg) positivity, countries with HBV prevalence >8% are considered high endemic regions, whereas countries with HBV prevalence between 2% and 8% are considered moderate endemic regions and countries with HBV prevalence <2% are considered low endemic regions for HBV (McMahon BJ 2008). India is classified as having intermediate endemicity for Hepatitis B (WHO). In this study, the seropositivity rate of HBsAg was 5.85%. Various other studies in India reports a seroprevalence of HBsAg positivity from 0.9% to 2.3% in blood donors (Gupta *et al.,* 1996; Sharma *et al.,* 2004; Singh *et al.,* 2004) to 4.35%–11.35% in various other populations tested (Qamer *et al.,* 2004; Kant and Hall, 1995; Jain *et al.,* 1992). This shows that the seropositivity rates for indoor patients are more than that of blood donors. Another study reports 11.92% positivity rate for HBsAg among inpatients in north India (Singh *et al.,* 2010). This is significantly higher than what is reported in our study. Our results are comparable to the World Health Organization data, according to which India is classified as having intermediate endemicity for Hepatitis B (WHO).

Seropositivity of HCV in our study is 2.39%. As reported by previous studies, the figures for seropositivity of HCV vary from 0.25 to 1.78% in blood donors (Sharma *et al.,* 2004; Singh *et al.,* 2004). One community based study in West Bengal reports a prevalence of 0.87% (Jaiswal *et al.,* 1996). Another study reports a seropositivity of 8.18% for HCV in the indoor patients (Singh *et al.,* 2010).

High positivity rates in patients of the internal medicine wards compared to the gynaecology and surgical wards for both HBsAg and anti HCV antibodies may be because the population tested includes patients with chronic symptomatic liver disease. Other reason may be that the patients in the medicine wards include those of malignancies and haemoglobinopathies. They receive multiple blood transfusions. These patients are prone to acquire transfusion transmitted infections by blood borne viruses like HBV and HCV, even when the tested blood is used (Saraswat *et al.,* 1996, Chaudhury and Phadke, 2001).

Lower positivity rates of 4.47% for HBV and 1.73% for HCV in patients of surgery wards probably reflect the community prevalence because these patients are usually tested for preoperative screening. Similarly the lower positivity rates of 2.7% for HBV and 1.06% for HCV in obstetrics and gynaecology patients are due to the regular antenatal testing.

In the present study, seroprevalence of HBV and HCV was significantly higher among males (6.4%, 2.7%, respectively) than females (4.9%, 1.9%, respectively). Probable reason for this has been attributed to the fact that males are more exposed to risky behaviours in terms of parenterally-transmitted HBV and HCV infections (Özkurt *et al.,* 2001).

Co-infection with HBV and HCV is not uncommon. In our study we found 54 patients positive for dual infection. The rate of co-infection in a randomly selected healthy population in one study was reported as 0.68% (Atanasova *et al.,* 2004). Chances of co-infection increases with age and it is more common in subjects aged more than 50 years (Gaeta *et al.,* 2003).

Table.1 Overall seroprevalance

Total no.	HBsAg +ve		Anti-HCV +ve	
	No.	% age	No.	% age
42392	2478	5.85%	1012	2.39%

Table.2 Seroprevalence of HBsAg and anti-HCV according to sex

Sex	Total		HBsAg +ve		Anti-HCV +ve	
	No.	%age	No.	%age	No.	%age
male	26128	61.7%	1676	6.4%	709	2.7%
female	16201	38.3%	802	4.9%	303	1.9%

Table.3 Seroprevalence of HBsAg and anti-HCV according to department

	Total	HBsAg +ve		Anti-HCV +ve	
Department		No.	%age	No.	%age
Surgery	21608	967	4.47%	373	1.73%
Medicine	13291	1304	9.81%	564	4.24%
Obst. & Gynae.	5665	153	2.70%	60	1.06%
Paediatrics	1765	54	3.06%	15	0.85%

Co- infection with HBV and HCV is associated with more advanced liver disease and an increased risk of hepatocellular carcinoma (Liaw *et al.,* 1995).

The possibility of coinfection reinforces the need for testing for all of these pathogens after an occupational exposure.

We observed that patients admitted in medicine ward have significantly higher risk for HBV and HCV infections. Our findings emphasize the importance of Universal Precautions for all health professionals, particularly those who work in internal medicine department, so as to limit hospital acquired infection.

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