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# Seropositivity Rates For Hepatitis B And C Viruses in a Tertiary Care Centre Of Northern India

***Corresponding Author:***
Dr. Vinod Singh,
Associate Professor and Head, Microbiology, Barlatullah University, Barkatullah University, 462026 - India

***Submitting Author:***
Dr. Vinod N Singh,
Associate Professor and Head, Microbiology, Barlatullah University, Barkatullah University, 462026 - India

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***Author(s):*** Singh V , Wal N , Venkatesh V , Tandon R , Singh M , Singh R

## Introduction

Hepatitis B (HBV) and C (HCV) are two hepatotrophic blood borne viruses (BBVs), that are important causes of liver related mortality and morbidity. They have similar modes of transmission, by parenteral, sexual and perinatal modes. HBV and HCV account for 400 million and 170 million chronic infections respectively [1,2]. As the clinical picture for both infections are varied and chronic asymptomatic carriage can occur, the initial diagnosis of infection is generally made by the detection of a serological marker, the Hepatitis B surface antigen (HbsAg) for Hepatitis B and anti-HCV antibodies for Hepatitis C viruses in both symptomatic and asymptomatic patients. Recent laboratory data was analyzed to obtain seropositivity rates for hepatitis B and C virus infections in admitted patients at our tertiary care centre and is presented here.

## Material and Methods

Laboratory records of the indoor samples tested for HBsAg and anti-HCV antibodies in the laboratory over two years, were retrospectively analyzed for this study, to determine seropositivity rates for HBV and HCV.

Commercial Enzyme Linked Immunosorbent Assays (ELISA) with high sensitivity was used to detect HBsAg (Surase B-96 -TMB, General Biologicals Corp, Taiwan or ETI-MAK-4, DiaSorin, Italy) as a marker for HBV infection. Anti-HCV antibodies, were detected by a third generation ELISA kit (SP NANBASE C-96, General Biologicals Corp, Taiwan). Samples were processed and tested as per manufacturer's guidelines.

## Results

A total of 5847 and 2457 blood samples were tested for HBV and HCV infections respectively. Overall 697 (11.92%) of the samples were positive for HBsAg and 201 (8.18%) for anti-HCV antibodies respectively.

The distribution of seropositivity for HBsAg and anti-HCV antibody, by the department of sample origin is detailed in Table 1. The paediatric wards show the highest seropositivity rates for both HBsAg (24.48%) and HCV (10.56%) followed by the medical wards (14.98% and 6.52% respectively) (Figure 1 and 2).

## Discussion

Both HBV and HCV infections appear to be fairly common in the population attending the wards at our centre. This may be because, as we are a tertiary care medical centre, the population tested would include patients with liver disease and other patients in the high risk group for acquisition of infection.

The higher seropositivity rates for HBsAg in the medical and paediatric wards compared to the gynaecology and obstetric and surgical wards may reflect the presence of patients with acute or chronic symptomatic liver infections in these wards. The very high positivity rates from the paediatric wards for both HBsAg and anti HCV antibodies may also be, because a fair number of these samples are from children admitted with haematological and other malignancies and haemoglobinopathies, populations who are prone to receiving multiple blood transfusions. Such patients have been documented to acquire HBsAg infections by BBV, even when tested blood has been used [3,4,5]. The 6.6-9.4% positivity for HBsAg and 6.7-7.8% positivity for anti HCV antibodies in the surgical and gynaecology and obstetric wards, probably best reflect the community prevalence, as testing in these wards is in large measure for preoperative or antenatal screening. Though the figures would need to be confirmed by community based screening in future studies, they fall in the expected range for Hepatitis B as per the World Health Organization, which classifies India as having intermediate endemicity for Hepatitis B [6]. The seroprevalence figures for HBsAg positivity in India vary from 0.9%-2.3% in blood donors [7,8,9]to 4.35%-11.35% in various other populations tested in different studies [10,11,12]. The figures for anti HCV antibodies vary from 0.25-1.78% in blood donors [8,9,13] to a prevalence of 0.87% in a community study in West Bengal, India [14].

Seropositivity for BBVs has medical, economic and social implications for patients. Confirmation of diagnosis requires several tests and adds to cost. For example the determination of true HBV infection in individual cases is complex and requires the

demonstration of repeatable reactivity in serological tests, preferably using different commercial ELISA kits, followed by confirmatory testing by a neutralization assay. Other additional tests would also be required to distinguish acute from chronic HBV infections. Similarly, the detection of anti HCV antibodies by the ELISA kit needs to be supplemented by strip immunoassays (SIA RIBA) and tests for HCV RNA for confirming HCV infection in individual cases [15]. Treatment for chronic infections such as antiviral therapy, interferon or liver transplantation, is expensive and available at only higher centers and leads to heavy economic burden both for the individual patients and public health care system. The high prevalence of HBsAg and anti-HCV antibodies in our hospital population tested is thus a cause for concern. The follow up and treatment of such cases is an expensive proposition and there are attendant social implications. It is also important that these patients are appropriately counseled in hospital to reduce transmission within the community.

These high seropositivity rates also implies that there is a real risk of occupational exposure to these blood borne viruses in our and other similar health care settings in this region. Occupational exposures to percutaneous injuries have been estimated to be a substantial source of infection by blood borne pathogens in health care workers [16], the highest estimated risks have been shown to be in nursing staff, followed by technical staff, doctors and other supporting staff [17]. Only knowledge, implementation and observance of Standard/Universal Precautions at all levels of health care workers, in addition to immunization for Hepatitis B will limit the possibility of nosocomial transmission. In 1983, the Centers for Disease Control (CDC), Atlanta introduced a set of guidelines termed ‘universal precautions’ for patients known to harbour blood-borne pathogens. These guidelines were extended in 1987 to include all patients. These precautions are a set of infection control measures that reduce the risk of transmission of bloodborne pathogens through exposure to blood or body fluids among patients and health care workers. Improving the safety of injections is an important component of universal precautions. More recently the concept of Standard Precautions has been introduced to cover both “Universal Precautions” and “Body Substance Isolation”, so that there is even greater protection against transmission of infectious agents and healthcare settings [18].Occupational exposure to bloodborne viruses in India has been well documented [19,20] and the prevalence of HBsAg seropositivity in health care workers, especially laboratory technicians is shown to be high [21]. Prevention of nosocomial transmission of blood borne viruses should therefore be a priority area in the health care sector. Knowledge, attitude and practices with regard to Standard/Universal Precautions is, however, still deficient in our country [22,23,24,25,26].Therefore there is a need for creating awareness among the senior health care professionals, health administrators and hospital management about the risks of occupational exposures to these infections and about practices that can be used to limit nosocomial transmission, so that adequate financial, material and man-power resources can be planned for and allocated. The need for training in biosafety at every level of health care worker also cannot be over emphasized.

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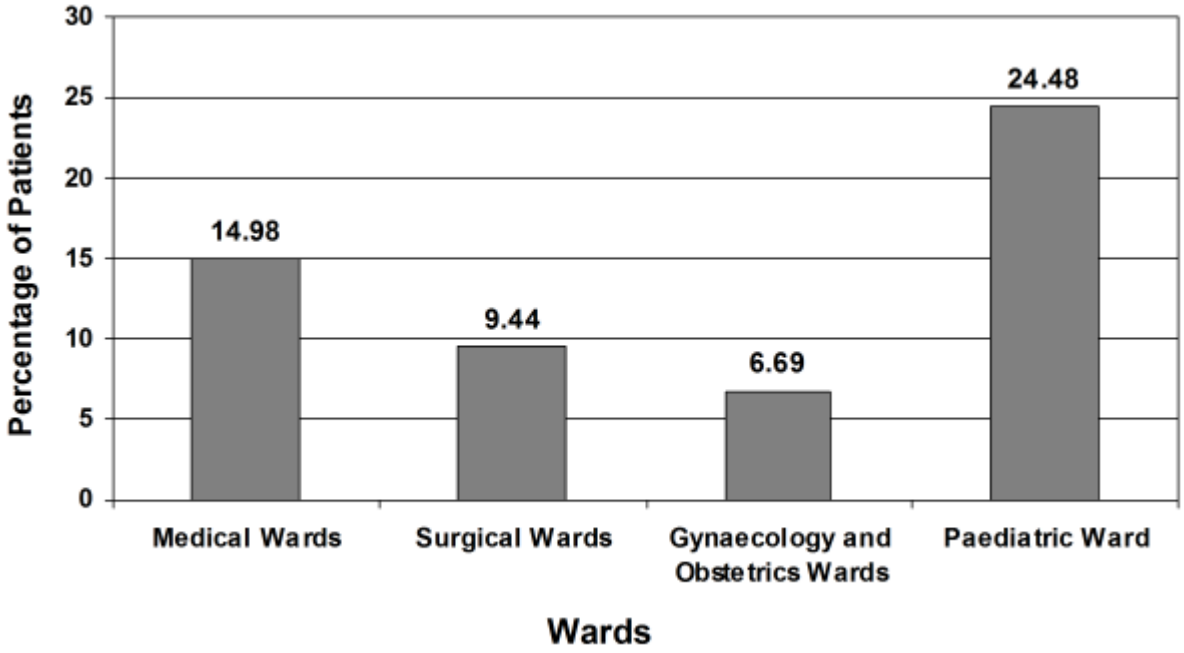
# Illustrations

## Illustration 1

fig 1



## Illustration 2

fig 2

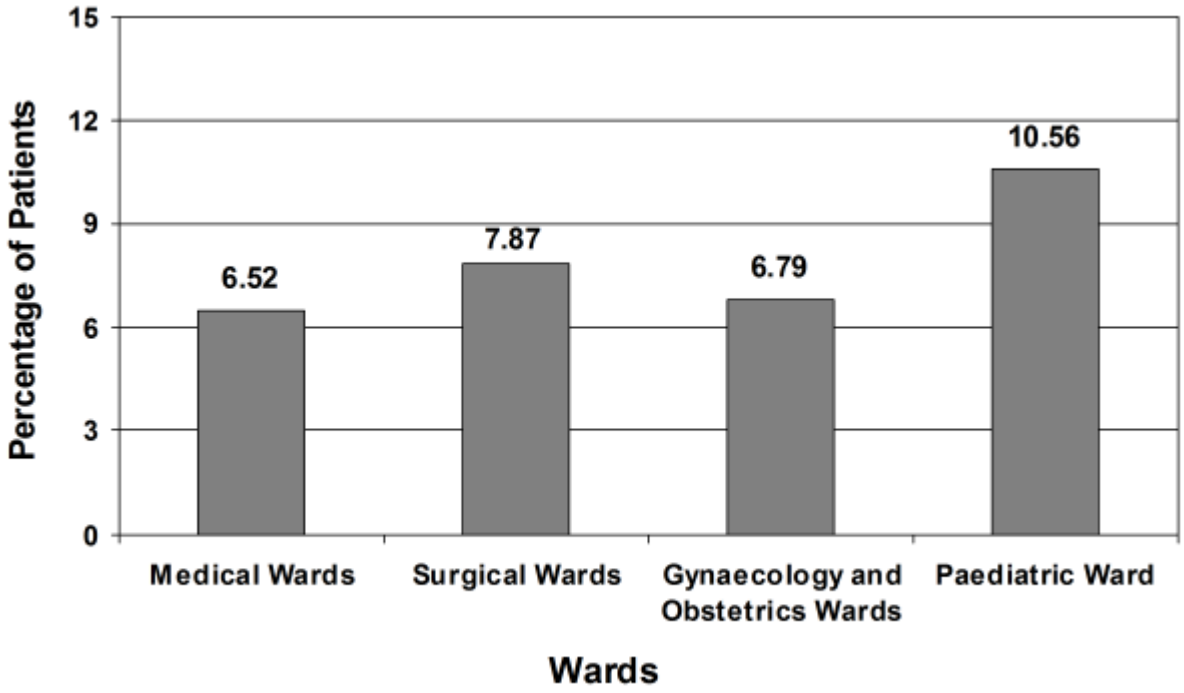



**Figure 2: Seropositivity rates for Anti-HCV antibodies in serum samples from different wards**

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