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Research Article

**FREQUENCY OF HEPATITIS B VIRUS INFECTION IN  
PATIENTS UNDERGOING CARDIAC SURGERY**<sup>1</sup>Dr. Sumaira Jabeen, <sup>2</sup>Dr. Abdul Farooq, <sup>3</sup>Dr. Nasira Nuzhat<sup>1</sup>Islamic International Medical College Rawalpindi<sup>2</sup>Islam Teaching Hospital, Sialkot<sup>3</sup>DHQ Hospital Narowal**Abstract:****Objective:** To know the hepatitis B surface antigen (HBs-Ag) incidence in patients undergoing cardiac surgery.**Study Design:** An Observational Study**Place and Duration:** The Study was performed in the cardiology department of Chaudhry Pervaiz Elahi Institute of Cardiology, Multan for the period of one year from April 2016 to April 2017.**Materials and Method:** 100 consecutive patients referred to the Cardiology Surgery Department. All patients who were negative for HBsAg before surgery were selected. The operation was interrupted for 4 to 6 months to reassess the HBs-Ag status.**Results:** Three out of 100 patients (3%) were positive for HBs-Ag after 04-06 months after cardiac surgery.**Conclusion:** Cardiac surgery is a safe procedure for the risk of HBs-Ag seroconversion; 3% of the patients received HBs-Ag seroconversion. More stringent diagnostic and precautionary measures are required to further reduce the spread of hepatitis B virus infection.**Keywords:** HBs-Ag seroconversion, Hepatitis B virus infection, cardiac surgery.**Corresponding author:****Dr. Sumaira Jabeen,**

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## INTRODUCTION:

Almost 2 billion populations globally are infected with B virus infection (HBV), and approximately 6 million people die each year due to hepatitis B infection and 400 million people have been exposed to chronic infection by HBV. Pakistan is very endemic for HBV infection; Approximately 9 million people are suffered with HBV infection and the rate of infection is constantly increasing. This may be due to the lack of poor economic status, adequate health facilities and a reduction in the awareness of transmission contagious diseases such as HCV, HIV and HBV. Hepatitis B is a life-threatening liver infection caused by hepatitis B virus, which may result in chronic liver disease, and can put people at high risk of death due to liver cirrhosis. The incubation period for hepatitis B is 4 to 20 weeks. Viral secretion is detected by exposure to infectious body fluids such as viruses or semen and vaginal fluids when viral DNA is detected in the tears, and urine of chronic carriers. In most cases, these transmissions are a result of incompatibility with recommended infection control applications designed to prevent cross contamination of medical equipment and devices. A number of blood tests are available for diagnosis.

Patients with hepatitis B can observe. They can be used to differentiate between acute and chronic infections.<sup>3</sup> The laboratory diagnosis of hepatitis B infection focuses on the detection of hepatitis B surface antigen (HBs-Ag). Cardiac surgery is a delicate operation and sometimes life-saving, and many patients who undergo cardiac surgery require blood transfusion. Any carelessness may make the patient susceptible to one or more blood infections. Infection with hepatitis B virus can be obtained if adequate blood is not detected. The purpose of this study was to determine the seroconversion of HBs-Ag using an enzyme-linked immunosorbent assay (ELISA) technique 4 to 6 months after cardiac surgery at the Chaudhry Pervaiz Elahi Institute of Cardiology, Multan for control of the theater equipment and sterilization.

## MATERIALS AND METHODS:

This observational study included 100 consecutive patients who underwent cardiac surgery in the cardiology department of Chaudhry Pervaiz Elahi

Institute of Cardiology, Multan for the period of one year from April 2016 to April 2017. Men and women of all age groups who applied for any cardiac surgery requiring extracorporeal circulation were recorded. Patients have excluded patients with evidence of HBV infection (laboratory data or laboratory), body piercing, tattoo marking, major / minor surgery or any new blood transfusion. Intravenous drug users and hepatitis B patients. The data were collected through a questionnaire containing information on demographic information and risk factors for the disease. Patients in the pre-operative room received serum samples just before going to the operating room for surgery. Clinical information was obtained by reviewing medical records from all patients. Patients with missing data were excluded. Serum was analyzed for HBs-Ag in a Punjab Cardiology Institute laboratory (a laboratory approved by ISO). All patients were followed up 4-6 months later to collect follow-up samples. In the post-operative period, they were asked if they were again in body piercings or any blood transfusions and were excluded if they confirmed any of them. Serum HBs-Ag was confirmed by ELISA technique (third generation) according to the manufacturer's instructions.

**ELISA:** This is a double antibody "sandwich" immunoassay using specific anti-HBs-Ag antibodies; monoclonal antibody against HBs-Ag immobilized on the bottom of microtitre wells and polyclonal antibodies for HBs-Ag conjugated with wild turbine peroxidase as a conjugate solution. During the test, the HBs-Ag in the sample reacts with these antibodies to form an immunoconjugate of the antibody-HBs-Ag-antibody-HRP. After the unbound material is washed during the test procedure, the substrate is applied to display the result. The appearance of blue color in the microtiter wells shows a reactive result of HBs-Ag. Not being rich shows non-reactive results in the sample.

**STATISTICAL ANALYSIS:** The data were analyzed with SPSS version 16.0. All qualitative variables are presented as frequency and percentage. Findings: Three out of 100 patients (3%) in the study group were converted to positive HBs-Ag within 4-6 months after cardiac surgery.

**DISCUSSION:**

Hepatitis B virus (HBV) infection is a major public health problem due to infectious diseases worldwide and is the cause of death. Approximately 2 billion people, about one third of the world's population, have serological evidence of past or current infection with HBV and 350 million people are chronically infected. This study was conducted to evaluate the incidence of HBV in postoperative cardiac patients at Chaudhry Pervaiz Elahi Institute of Cardiology, Multan. After cardiac surgery, 3% of patients tested positively for HBs-Ag on 4-6 month follow-ups. Potential factors for HBV infection during cardiac surgery include low sterilization quality, disinfection procedures, and less ideal blood detection, which is transfused to the patient during cardiac surgery. In a study of patients with inflammatory bowel disease (IBD), when surgical treatment was required due to IBD complications, it was found that these patients had a significant risk of transmission of HBV infection. Stages of HBV virus infection shown in table I

HBsAg anti-HBc anti-HBs	negative negative negative	Susceptible
HBsAg anti-HBc anti-HBs	negative positive positive	Immune due to natural infection
HBsAg anti-HBc anti-HBs	negative negative positive	Immune due to hepatitis B vaccination
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive positive negative	Acutely infected
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive negative negative	Chronically infected
HBsAg anti-HBc anti-HBs	negative positive negative	Interpretation unclear; four possibilities: 1. Resolved infection (most common) 2. False-positive anti-HBc, thus susceptible 3. "Low level" chronic infection 4. Resolving acute infection

One study conducted by Gastroenterology, Department of Rawalpini Military Hospital and reported that infection was hepatitis B and C and reported 2% seroconversitivity to evaluate the risk of superior gastrointestinal endoscopic procedure to transmit an incidence of HBs Ag; 1 of these two patients had non-selective blood transfusion after endoscopy. A study in the US showed that infection

control practices were performed as gastrointestinal endoscopy that did not meet the required standards about twenty years ago. The different studies of patients undergoing surgery showed a prevalence rate of  $7.397 \pm 2.012\%$  HBV. Possible risk factors for surgical patients include reuse of contaminating syringes, contra-lateral surgical instruments and blood products. In a study from Nawabshah, Sindh reported that lack of knowledge and poor attitude in detecting infection with HBV and HCV 11. A possible source of infection during cardiac surgery can be a positive surgeon for steel seams to close the HBV, heart lung machine, blood transfusion and sternum. Healthcare workers in Pakistan do not routinely scan for blood borne viruses. Patients require blood transfusion during cardiac surgery. Routine screening in Pakistani blood banks is based on the ICT kit method, but the ICT kit method is certainly not a false screening method because sometimes it gives both false positive and false negative results. Our study showed the incidence of 3% HBV infection in postoperative cardiac patients. Such infections should be tried to minimize the risk of infection as much as possible. To reduce the incidence of HBV infection, we recommend that the blood bank screening method is based on the new ELISA technology, that the sterilization processes of surgical instruments and operating rooms are improved and that health workers are screened. HBV infection at regular intervals.

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